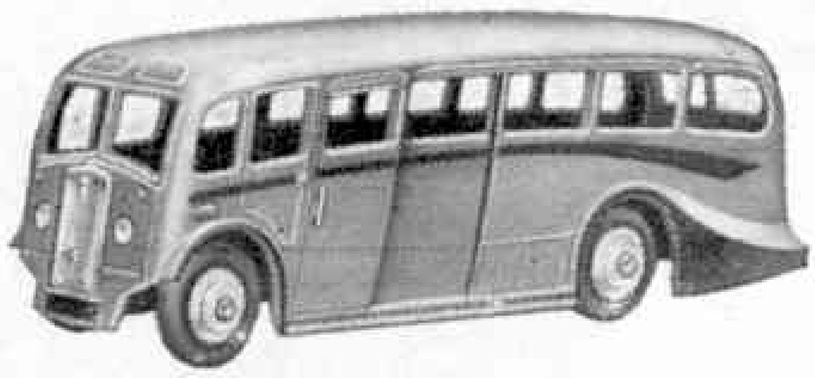
VOL. XXXVI. No. 6 JUNE 1951

MECCANO MAGAZINE

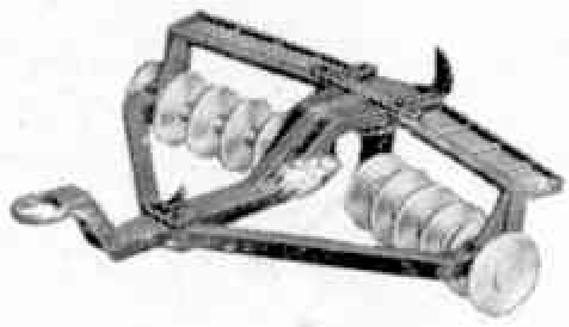
SOUTHBOUND "ENTERPRISE" LEAVING DUBLIN

DINKY TOYS

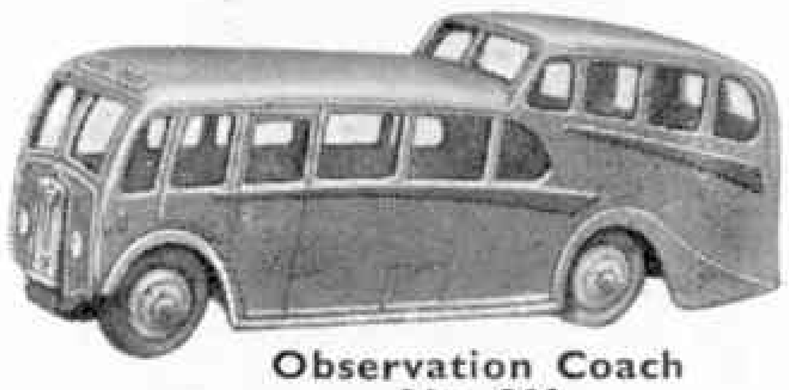
Electric Dairy Van
No. 30v



Luxury Coach
No 29g

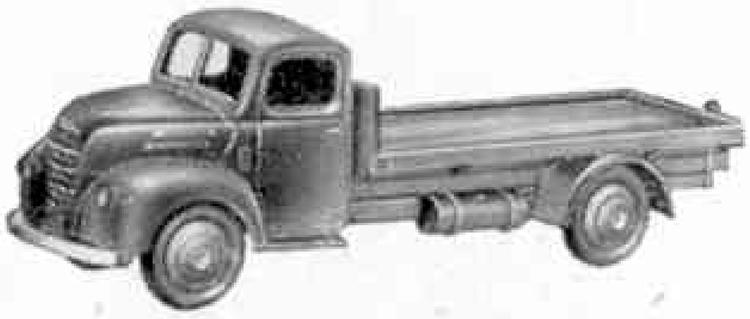


Disc Harrow
No. 27h

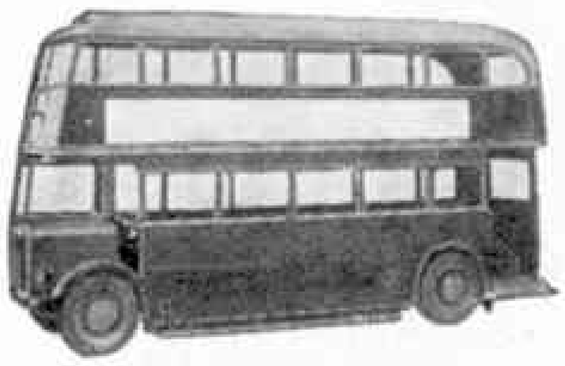


Observation Coach
No. 29f

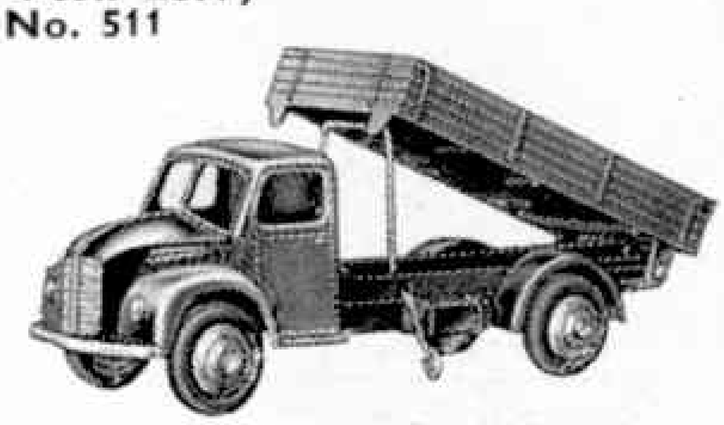
Guy 4-ton Lorry
No. 511



Fordson 'Thames' Flat Truck
No. 30r

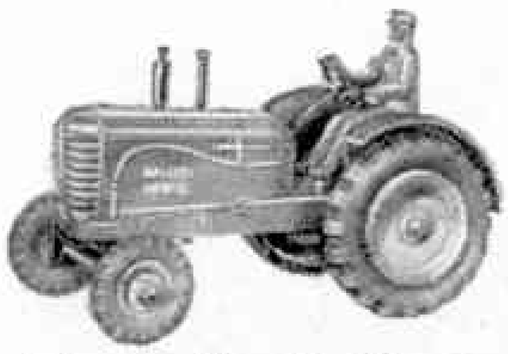


Double Deck Bus
No. 29c



Rear Tipping Wagon
No. 30m

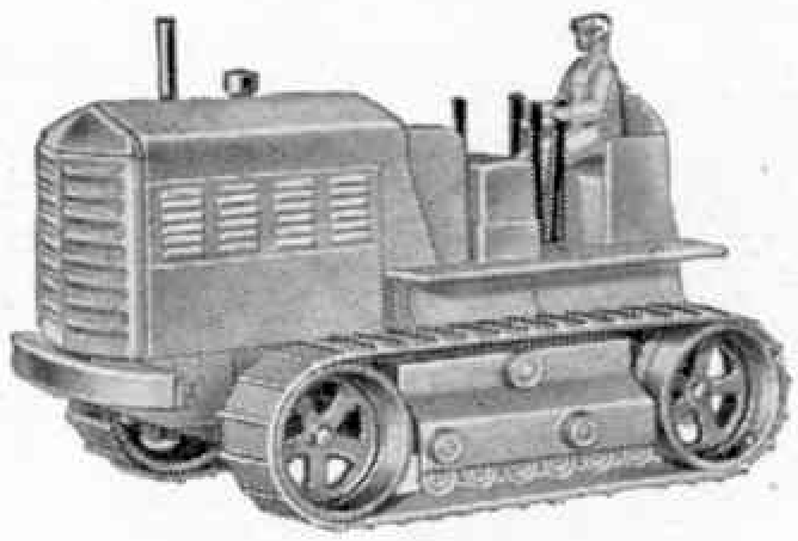
Rover 75 Saloon
No. 140b



Massey-Harris Tractor
No. 27a

Austin 'Atlantic' Convertible
No. 140a

Coles Mobile Crane
No. 571

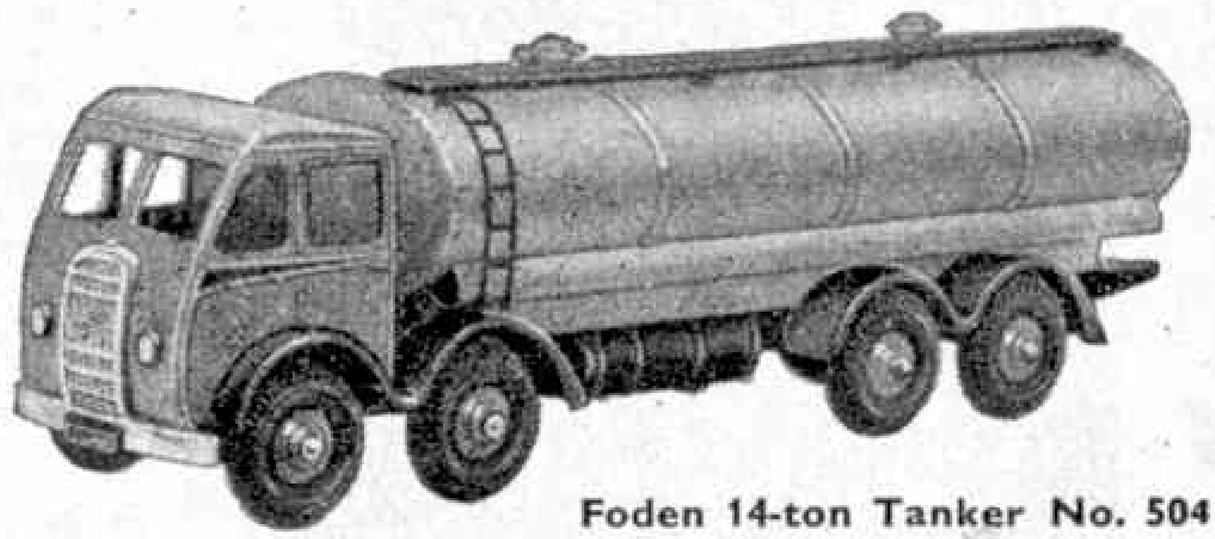


Heavy Tractor
No. 563

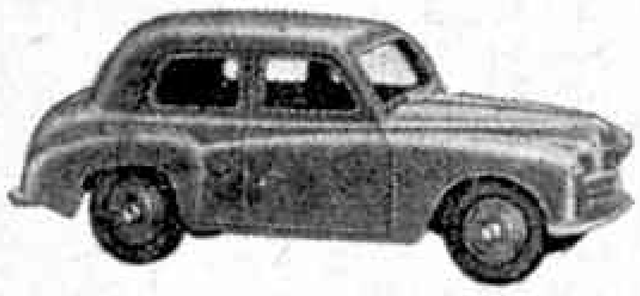
MADE IN ENGLAND BY MECCANO LIMITED

DINKY TOYS

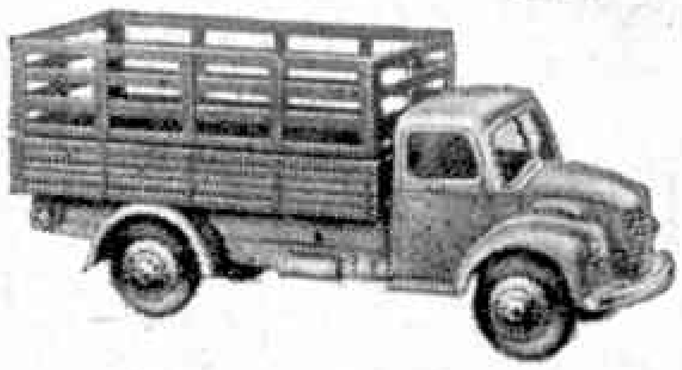
Austin Covered Wagon
No. 30s



Foden 14-ton Tanker No. 504



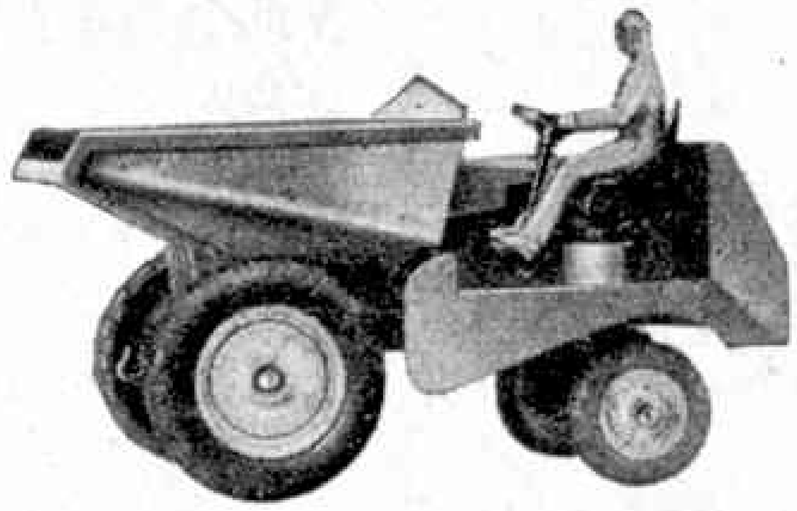
Hillman Minx Saloon
No. 40f



Farm Produce Wagon
No. 30n

Estate Car
No. 27f

Bedford End Tipper
No. 25m



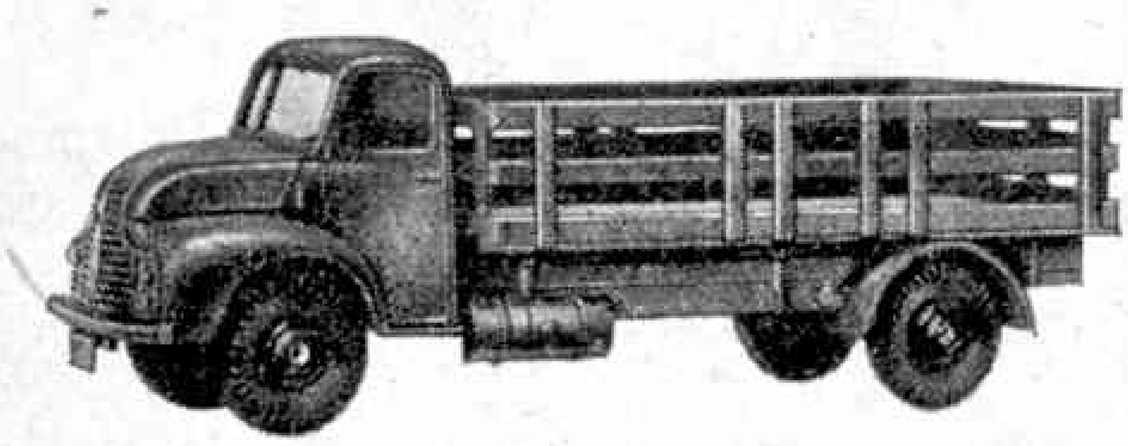
Dumper Truck No. 562

Land-Rover
No. 27d

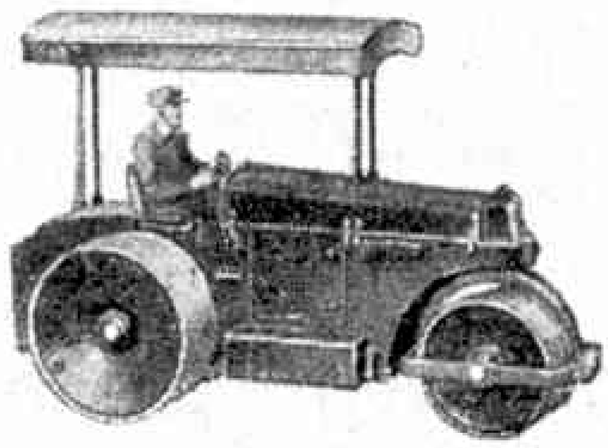
The Standard "Vanguard"
Saloon, No. 40e

Trojan 15 cwt. Van "Esso"
No. 31a

Breakdown Lorry
No. 25x

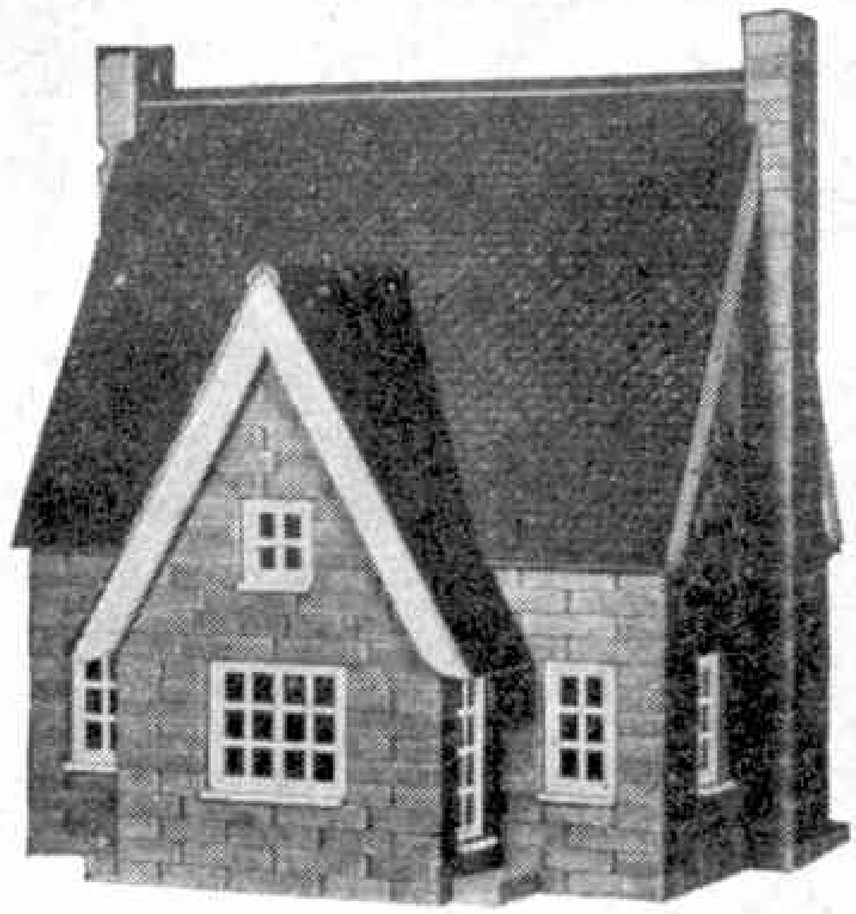


Leyland "Comet" Lorry
No. 531



Aveling-Barford Diesel Roller
No. 25p

MADE IN ENGLAND BY MECCANO LIMITED



YOU can build this INN

WITH

BRICKPLAYER

BRICK & MORTAR BUILDING KIT

It enables you to build Garages, Houses, Railway Stations, Signal Boxes, or from your own imagination. All railway models will fit 'O' gauge scale. Buildings can be permanent, or dismantled by merely soaking in water and the bricks used again and again.

BRICKPLAYER KITS AT 28/6 AND 52/6 ARE AVAILABLE FROM GOOD TOYSHOPS, HOBBY SHOPS AND DEPARTMENTAL STORES

ACCESSORY PACKS

No.	Contents	Price
100	100 Full size Bricks	3/-
101	52 ¾-Bricks and 72 ½-Bricks	3/-
102	Gable and Peak Bricks	3/-
111	Capping and Roof Tiling	2/6
112	Concrete Roofing	2/6
114	Bag of Brickplayer Cement	1/3
115	Roofing Cement	9d.
8107	2 Bay Windows with 31 Splay Bricks ..	3/9

METAL WINDOW AND DOOR FRAMES

F1	F2	F3	F4	F6	F8	F10
8½d.	6½d.	7½d.	5d.	4d.	6d.	7½d.

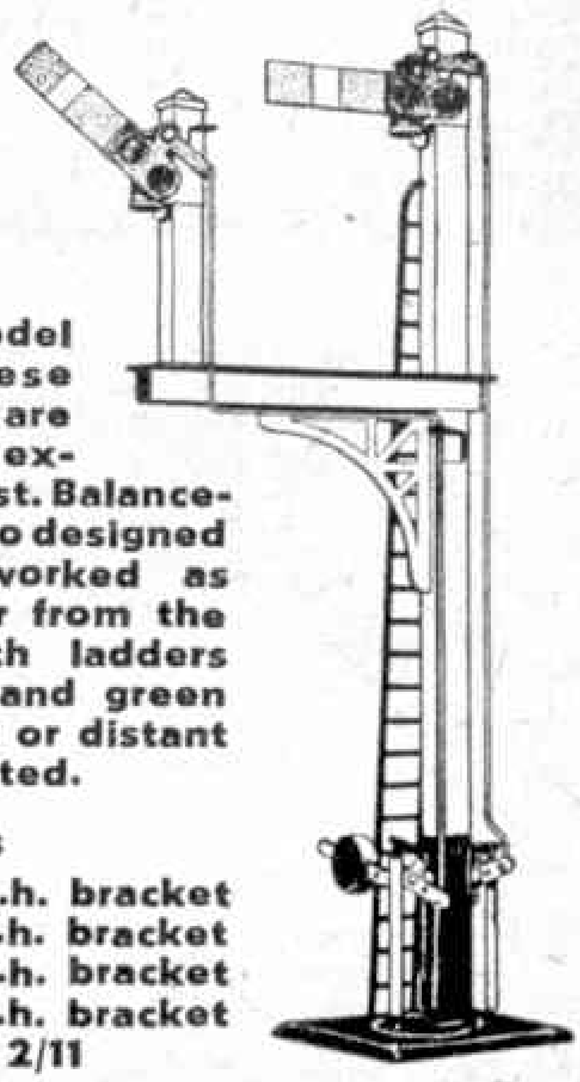
8108 Sheets of Glazing, 1⅜ in. x 6 in. (Plastic) 1¼d.

If your dealer cannot supply, write for address of nearest stockist to:

J. W. SPEAR & SONS LTD.
DEPT. M • ENFIELD • MIDDLESEX

GAUGE 'O'

SEMAPHORE SIGNALS



To enhance your Model Railway system these excellent accessories are worthy of the most exacting model enthusiast. Balance-weights and levers are so designed that they can be worked as 'hand-lever, signals or from the cabin. Complete with ladders and transparent red and green spectacles, with home or distant arms as illustrated.

Double Arm Brackets

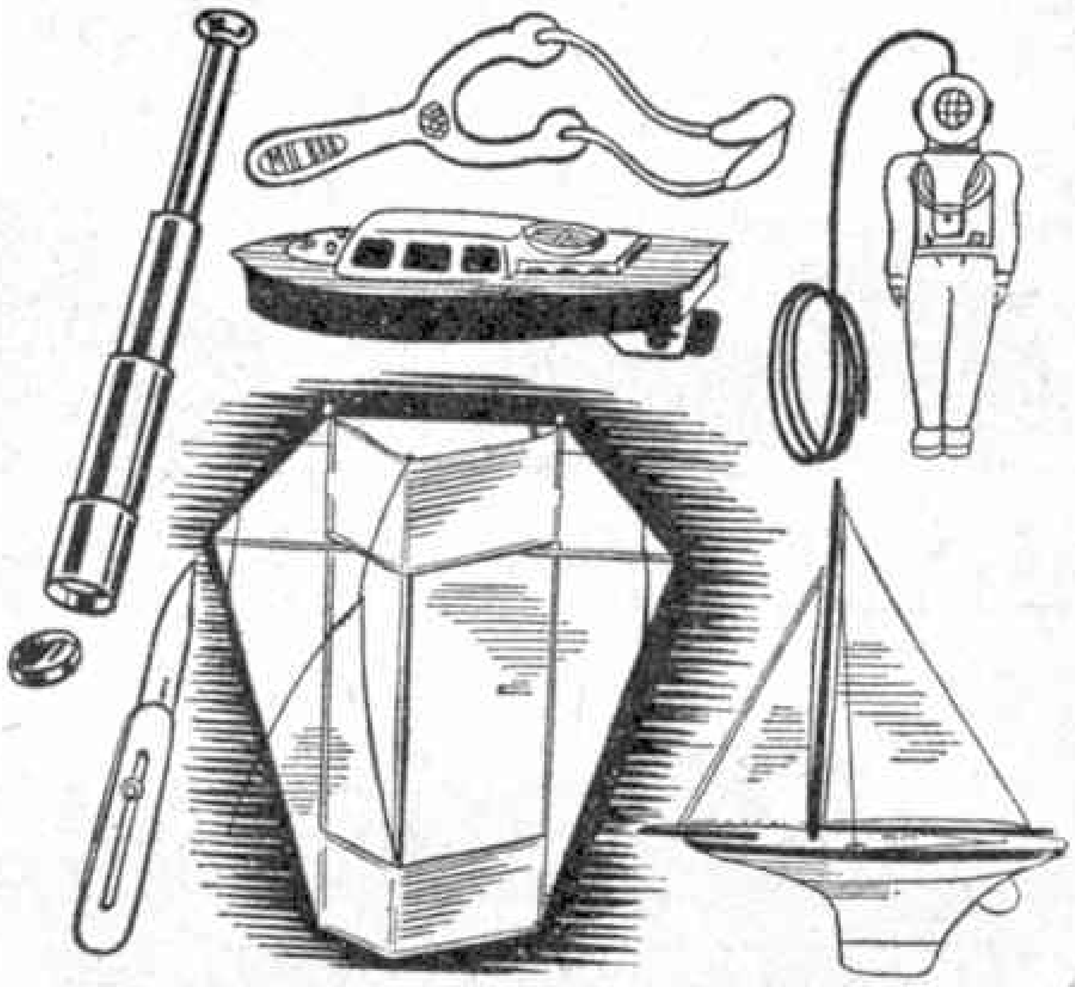
No. 6230/0 Home l.h. bracket
No. 6231/0 Distant l.h. bracket
No. 6220/0 Home r.h. bracket
No. 6221/0 Distant r.h. bracket
12/6 each, P.T. 2/11

Other accessories include: Single and Double Arm Signals, Colour Light Signals, Loading Gauges, etc. Write for illustrated catalogue "Gauge 'O' Scale Model Railways" Price 1/-, ref. GO/17.

BASSETT-LOWKE LTD.
NORTHAMPTON

LONDON: 112, High Holborn, W.C.1
MANCHESTER: 28, Corporation Street

ANOTHER OUTSTANDING BARGAIN OFFER



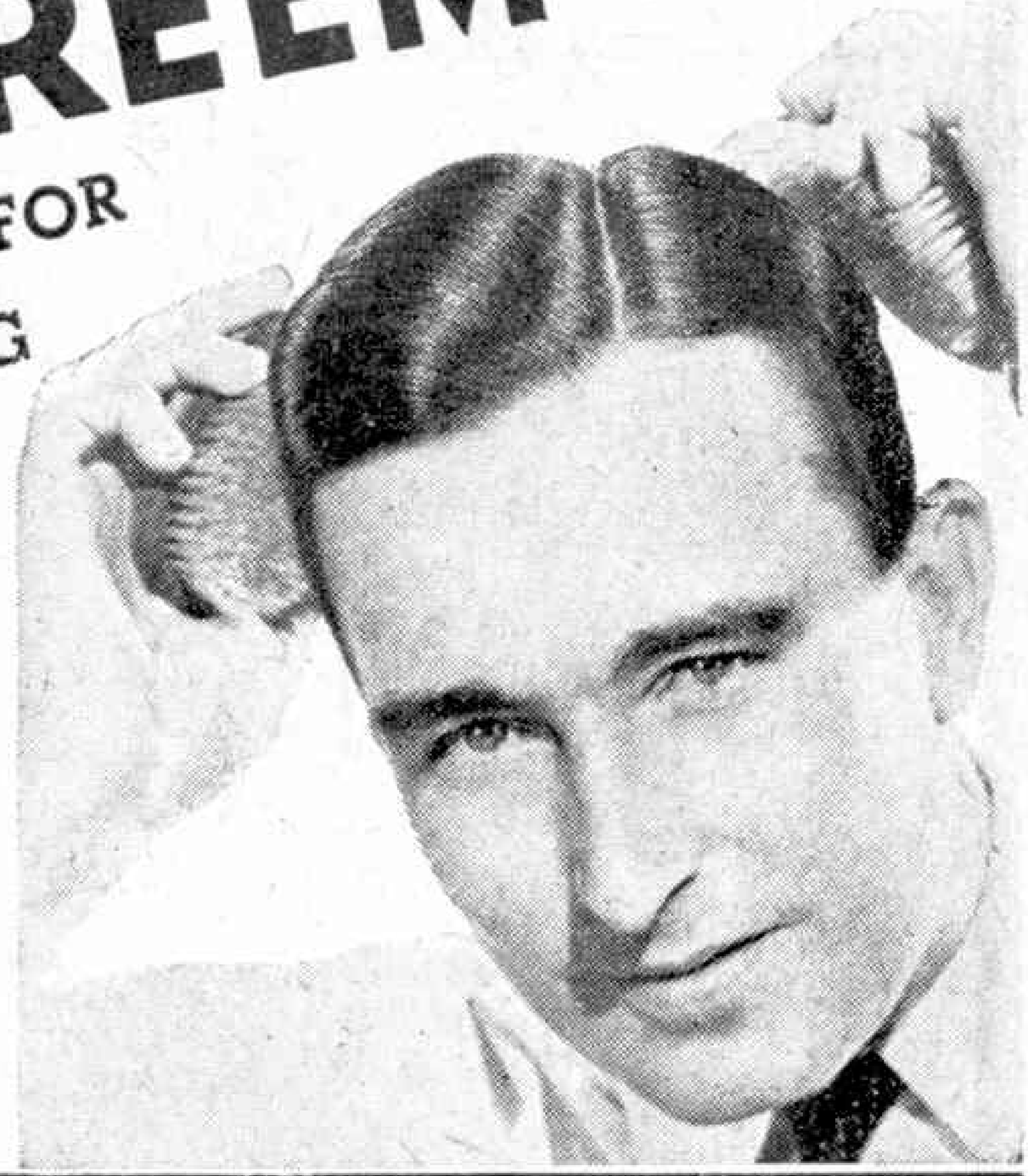
EX-R.A.F. AIR-SEA RESCUE KITE (COST £££s). A first-class fabric kite, 3 ft. high with collapsible duralumin frame complete with over 150 ft. of cord and protective cover. Extra strong, shoulder sling carrying case for above 2/6 extra. **15/-** Post 1/- **NEW 11 in. CABIN CRUISER.** Fast clockwork model beautifully detailed with dinghy, pennants, navigation lights, etc. **10/6** Post 10d. **TRIANG YACHT.** 14 in. steel hull, embossed deck and folding mast. **6/11** Post 1/3. **DIVER.** Sinks or rises at will by air pressure. Two Sizes **1/6** or **3/6** Post 4d. **DAN DARE** 12 in. Telescope **3/9**. 8¾ in. Telescope **1/9** Post 4d. **HIGH-POWERED CATAPULT.** Aluminium "Thumbgrip" handle **3/11** Post 6d. **SLIDE KNIFE.** Stainless Sheffield blade has 5 locked positions **2/11** Post 4d.

B. R. ROBIN, 100, EAST STREET, LONDON S.E.17

Smart men know

BRYLCREEM

IS *EMULSIFIED* FOR CLEAN GROOMING



You're perfectly set for the day when you use Brylcreem, for Brylcreem is the perfect hair-dressing. There's no excessive oiliness in Brylcreem, because its pure natural oils are emulsified into a rich cream. Brylcreem grooms without gumming and gives life and lustre to Dry Hair. Ask for Brylcreem — most men do! Brylcreem is in tubs 1/5d. and 2/3d., jars and tubes 2/3d. and large economy tubs 4/-.

County Perfumery Co. Ltd., Stanmore, Middx.

royds 38/38

GAMAGES

The New 'SPEEDIA'

LAND YACHT

Length 23 in. Height 27 in.

All the thrills of "sailing" at exceptional speeds on any smooth land surface. Exceptionally well made and finished. Specially designed "Bermuda" rig and wheel lay-out for maximum efficiency.

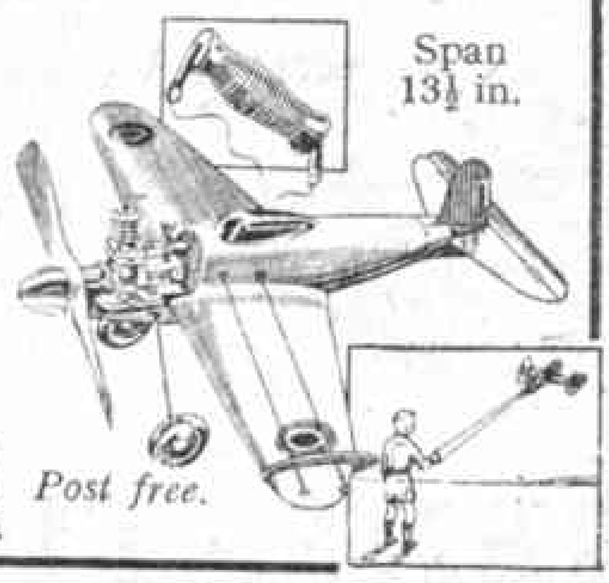
33/-

Post and pkg 1/-.

"CHALLENGER"

Aircraft Complete with Engine. The first ever FULLY-FINISHED ready-to-fly Control Line Trainer.

Designed by expert aero-modellers and includes: Unbreakable propeller, removable undercarriage, and practically unbreakable plastic wings and fuselage. Specially designed for the E.D. Bee 1 c.c. diesel. Complete with plastic control handle and lines.



Span 13½ in.

Complete with Engine. **91/6** *Post free.*

Aircraft **39**/-. Engine **52/6.**

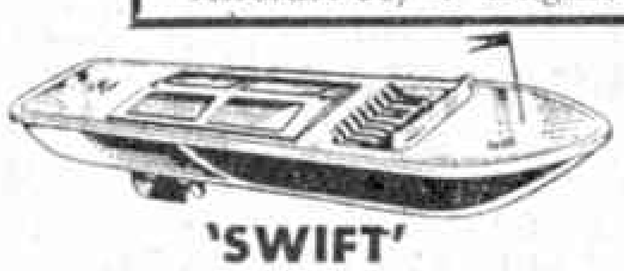
'TRI-ANG'

YACHT

with Automatic Steering.

Well balanced and snappy in appearance. All Steel hull. Folding mast. Fully Adjustable redwing rig sails, 24 in. long. 3 ft. 2 in. high.

28/6 *Post and pkg. 1/6.*



'SWIFT'

ELECTRIC BOAT

Variable speed and reverse control. Beautifully finished in Cream and Red with Brown Hatch cover. Length 17 in. × 4 in. Beam. Driven by 3 U2 batteries, 1/6 extra.

Post and pkg. 1/-. **26/11**

'SNIPE'

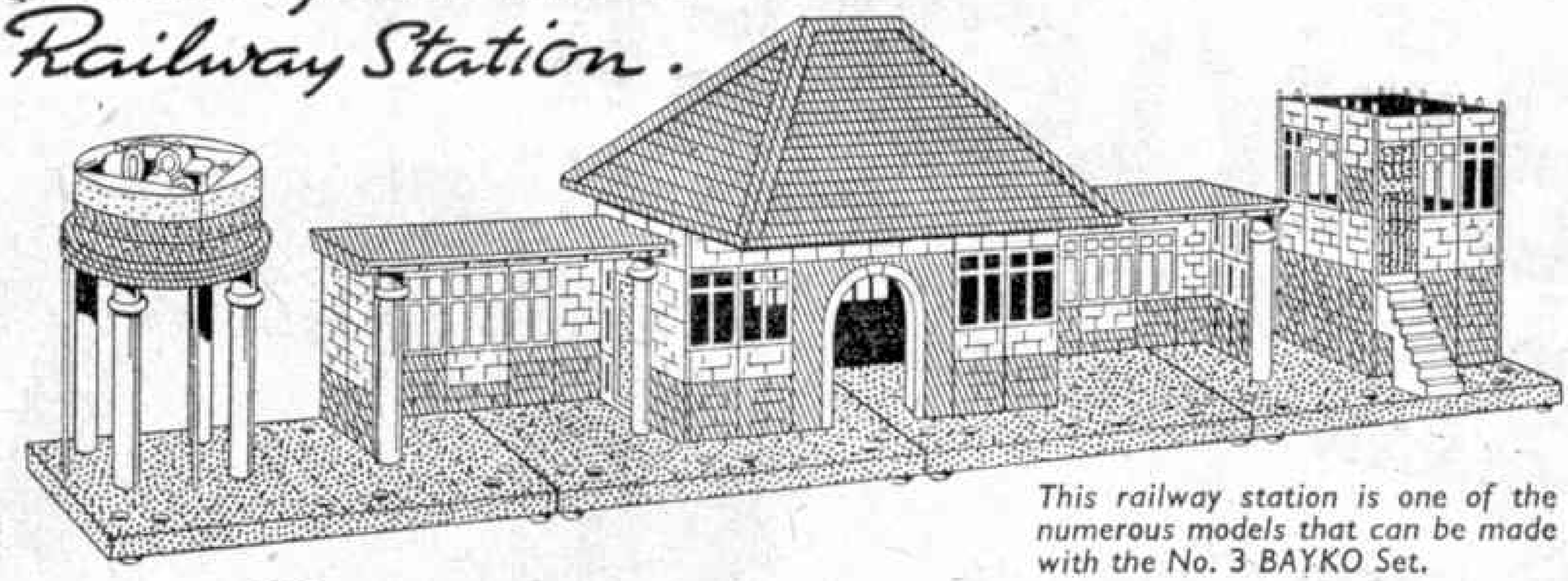
ELECTRIC LAUNCH

Length 14 in. Runs on two U2 type batteries. Aluminium hull finished Red/Cream or Blue/Cream. Combined variable speed and stop lever. Batteries 1/- extra.

Post and pkg. 10d. **19/11**

GAMAGES, HOLBORN, LONDON E.C.1 **64-Page CONJURING LIST 1/-** *Post free*

Build your own Railway Station.



This railway station is one of the numerous models that can be made with the No. 3 BAYKO Set.

ASK YOUR DEALER FOR DETAILS OF

BAYKO

the Original Plastic BUILDING SETS

Made from richly coloured, high-grade plastic material, BAYKO is beautifully finished, easily cleaned and will survive years of hard treatment.

PRICES:

No. 0	15/-	No. 0x	7/6
No. 1	22/6	No. 1x	15/-
No. 2	37/6	No. 2x	22/6
No. 3	59/-		

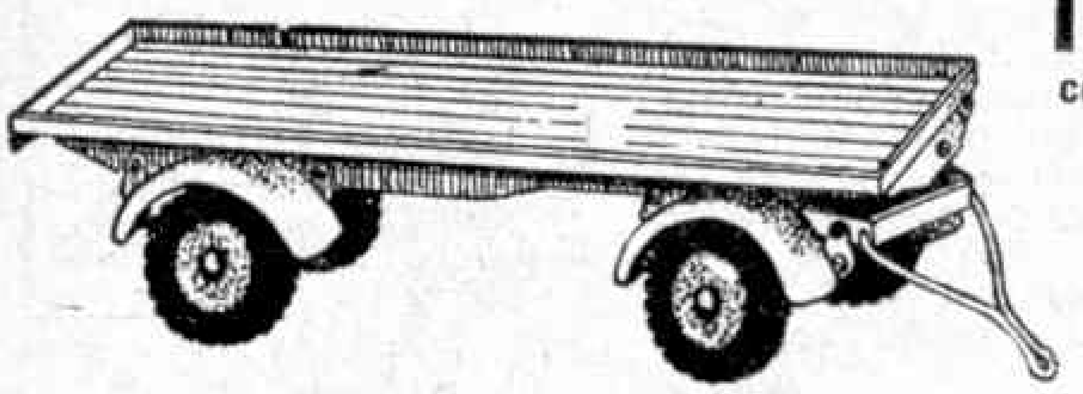
PLIMPTON ENGINEERING Co. Ltd.
GIBRALTAR ROW, LIVERPOOL 3

For Your Foden

ABBEY-SHACKLETON CONSTRUCTIONAL VEHICLE

8 TON DYSON TRAILER

PRECISION BUILT SCALE MODEL



18/6 complete

Also available

FODEN TIPPER ... 63/6
FODEN F.G. ... 57/6

Both mechanically driven

All Abbey Shackleton models take down like the real thing

ASK YOUR DEALER FOR FULL DETAILS

Marketed by ABBEY-CORINTHIAN GAMES CO., London

SENSATIONAL!

THE FAMOUS "RAMBLER" BINOCULARS

This is a really wonderful instrument—and unbeatable value! Beautifully moulded and with strong adjustable lens for powerful magnification. Complete with neck lanyard. Ideal for camping, theatre and all sports.

Real binoculars, NOT a toy. 7 day approval or money refunded. *ONLY* **7/6** *Post* 6d.

W. D. MORGAN & CO. LTD.

DEPT. MM4, 2, GRAY'S INN ROAD, LONDON W.C.1

THE CARTON TO LOOK FOR

IF YOU WANT BULBS THAT WILL LAST

Well worth striving for though still in short supply. They are THE VERY BEST. Look for VITALITY the next time you buy a bulb for your Cycle, Cine Projector or Radio set.

Made at:

NEVILLE PLACE, WOOD GREEN, LONDON N.22

Your luck's in if you have one of these!

See how much more you can see with one of these S.E.L. Optical Products!

S.E.L. POCKET COMPASS
Will last you a lifetime. The pointer is made from the finest cobalt steel, and retains magnetism at full strength indefinitely. With screw cap.
4/- no tax

S.E.L. SPORTS GLASSES
Beautifully finished with chromium-plated metal parts and complete with neck lanyard. A really fine optical instrument.
45/- no tax

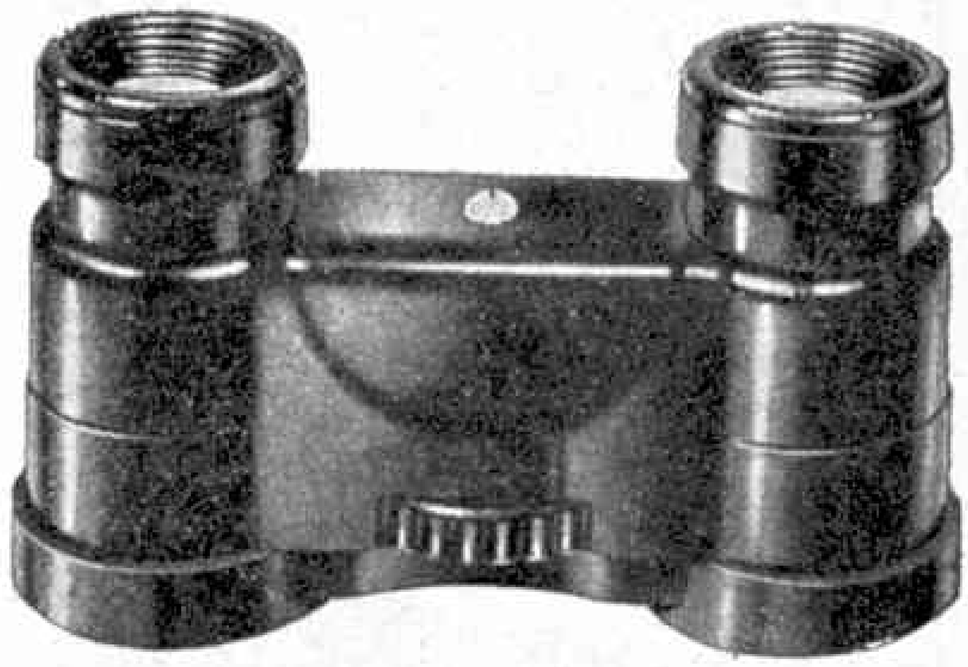
See also for younger boys the
RAMBLER BINOCULARS 7/6 no tax

S.E.L. POCKET TELESCOPE
Ideal for scouts, hikers and those interested in birdwatching and other outdoor activities. Extends from 3⅜" to 8½". Strongly made and beautifully finished. **6/6** no tax

Also 3-section Telescope **5/-**, no tax

For the younger boy
the 'MERIT' TELESCOPE
2/- no tax

S.E.L. POCKET BINOCULARS
Strongly made, will give years of service under all conditions. Size 3¾"x2"x1". Weight 4oz., unnoticed in the pocket.
17/6 no tax



We regret that prices are subject to alteration

See them all at your dealer's

or send postcard for illustrated list of all S.E.L. products to

SIGNALLING EQUIPMENT LTD

(Dept. 3), Merit House, Potters Bar, Middlesex

FOR FACES & PLACES

ILFORD SELOCHROME **FILM**

Railway Equipment

by B T-H

Whether for main-line or suburban service, BTH electric traction equipment, of exceptional reliability and proved performance, can be supplied.

For electric traction equipment of any description—
specify BTH.

THE
BRITISH THOMSON-HOUSTON
COMPANY LIMITED, RUGBY, ENGLAND. A 4279

There is only one 'Plasticine'—made solely by Harbutt's Plasticine Ltd. You will find 'Plasticine' invaluable for adding the touch of realism to your models. For prototypes, 'mock ups' and other uses there is no more practical medium than

'Plasticine' REGD.

Sole Manufacturers:
HARBUTT'S PLASTICINE LIMITED
BATHAMPTON, BATH, SOMERSET

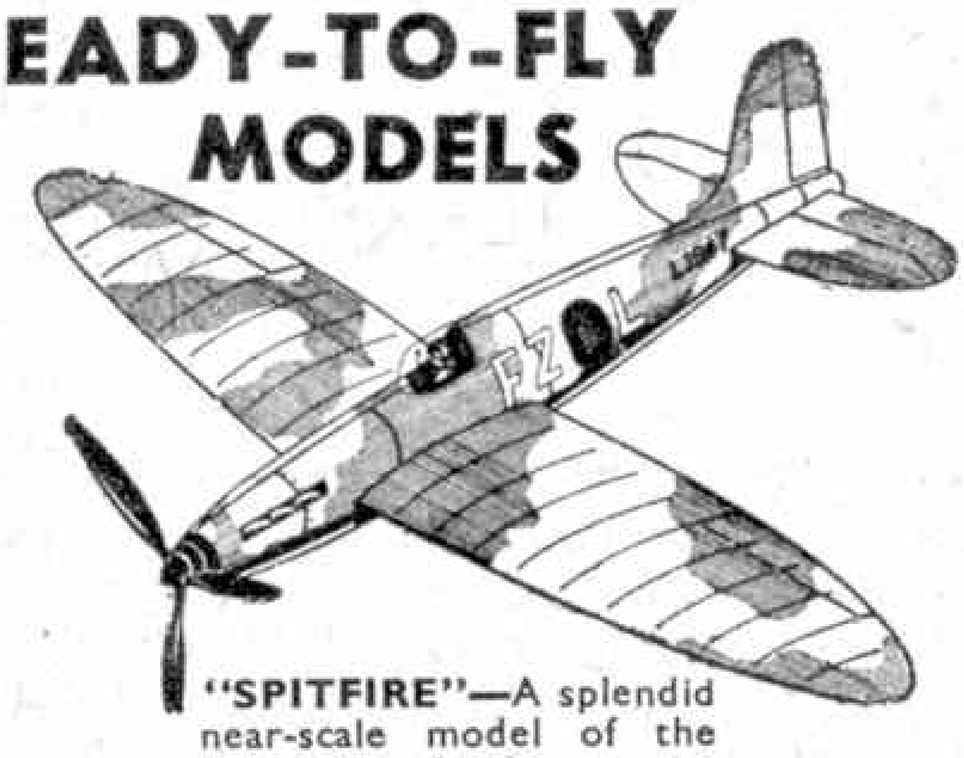
Modellers!

Your PLANE or BOAT is here..

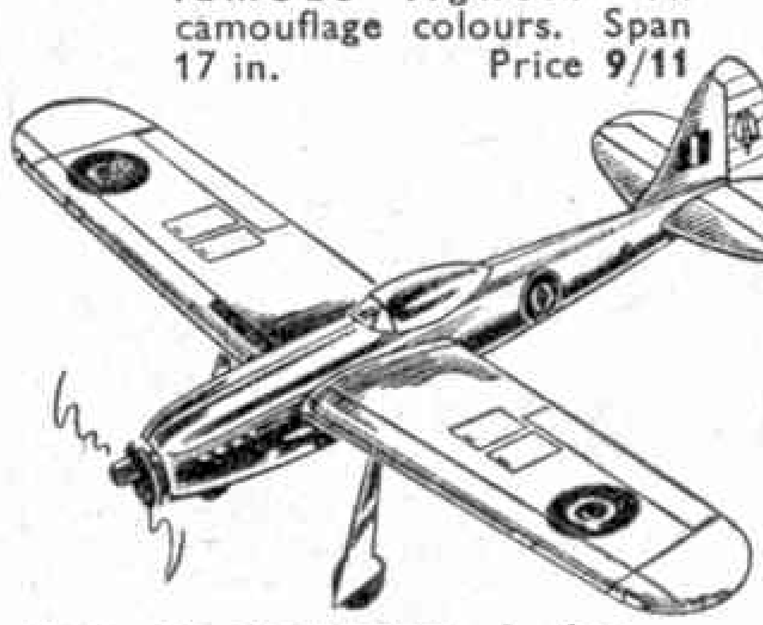
FROG

TRADE MARK

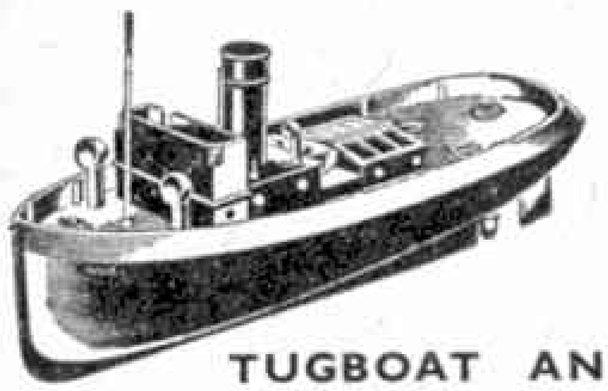
READY-TO-FLY MODELS



"SPITFIRE"—A splendid near-scale model of the famous fighter in camouflage colours. Span 17 in. Price **9/11**



MK. V FIGHTER—A fast and terrific climber. This famous model is rubber-powered and is ready-packed in the well-known FROG high-speed winder box. Price **12/6**



TUGBOAT ANNIE — A Thames tug in miniature with specially geared clockwork motor. Length 7½ in. Price **6/6**

Whether you're a test pilot or a yachtsman there is a model for you at your local FROG and PENGUIN stockist. Call there to-day—you will see a large selection of ready-to-fly model planes plus a huge range of constructional kits and miniature aero engines at prices you can afford.

For the watercraft enthusiast there is fine flotilla of high speed cruisers—like those illustrated here—with other new and interesting models such as a fishing drifter and Ocean Racing Yacht now reaching the shops.

PENGUIN

TRADE MARK

CLOCKWORK SCALE MODEL BOATS

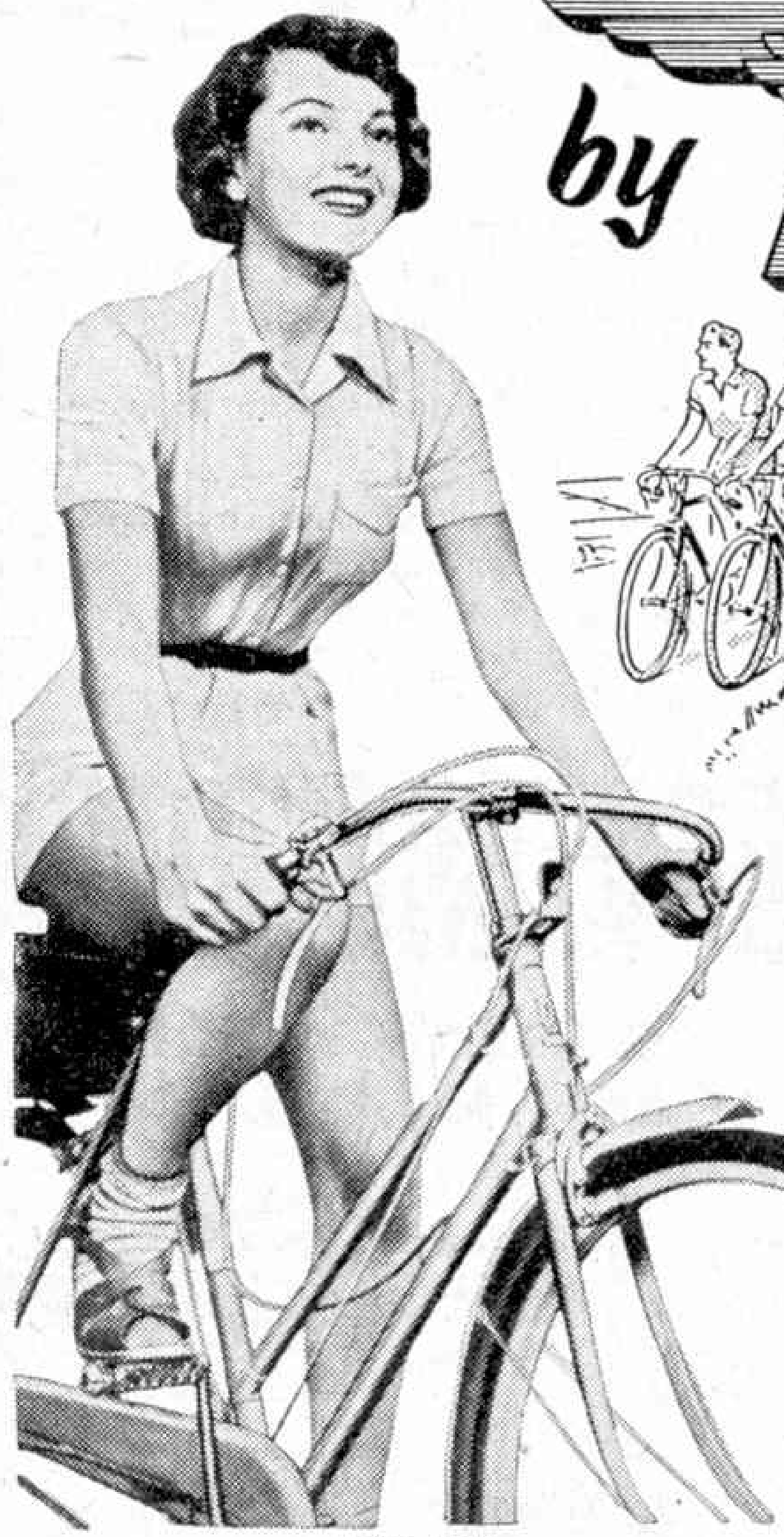
Available from your Local Dealer. We do not supply direct.

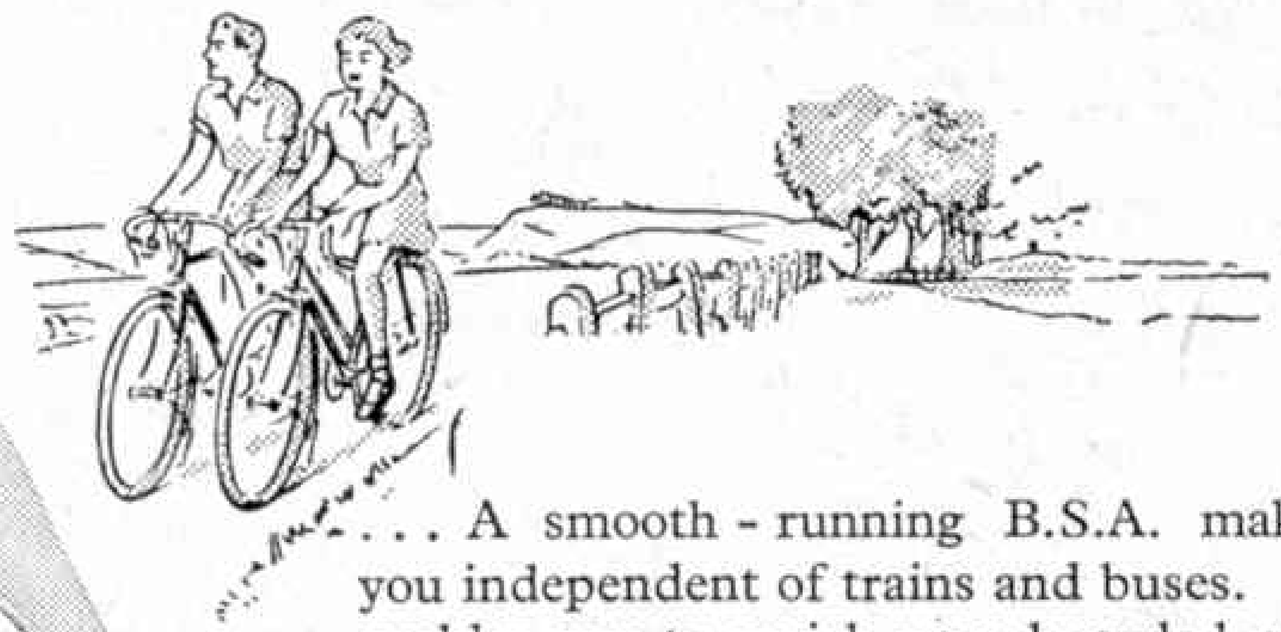
11 in. CABIN CRUISER—A fast, clockwork-powered cruiser with beautifully detailed hull and deck. Complete with dinghy, pennants, navigation lights, etc. Price **11/6**

9 in. "SOLENT" CRUISER—A fine model with contrasting hull and deck and windows in cabin. Fitted with a powerful motor and 3-blade screw. Price **7/6**

INTERNATIONAL MODEL AIRCRAFT LTD.
Merton, London S.W.19, England

Carefree Tours by BSA





. . . A smooth - running B.S.A. makes you independent of trains and buses. It enables you to enrich your knowledge of famous beauty spots which public transport either misses altogether or rushes past. Your holiday money lasts longer, too, when you spend it on a cycling tour—you save so much in fares.

DISCOVER THE BEAUTY OF THE COUNTRYSIDE

SEND NOW

for the 1951 Edition of the B.S.A. Catalogue which contains details of a whole range of fine bicycles.

To B.S.A. CYCLES Ltd.,
31 Armoury Rd., Birmingham, 11.
Please send Cycles Catalogue.

Name _____

Address _____

Post in unsealed envelope using 1d. stamp.

It's time you had a BSA

Next Month: "WORLD'S GREATEST LISTENING STATION." By T. Holloway

MECCANO MAGAZINE

Editorial Office:
Binns Road
Liverpool 13
England

Vol. XXXVI
No. 6
June 1951

With the Editor

The *"Enterprise"* Express

I am sure readers will welcome the article in this issue on the Belfast-Cork *"Enterprise"* express of the G.N.R. (I.) and C.I.E. This story of the *"Enterprise"* service has been specially written by my friend Mr. W. A. Ryan, of the G.N.R., to accompany the splendid cover this month.

In view of the success of the through service, provided by what is surely the finest train in Ireland, it is unfortunate that its brief career has already been interrupted twice. The first occasion was in December last resulting from the strike on the C.I.E.; while the second, dating from March this year, was brought about by the curtailment of the services due to the coal situation. It is anticipated that the through service will be restored during this month. In the meantime what is normally the through *"Enterprise"* to and from Cork is running between Belfast and Dublin only.

Standard Coaches for British Railways

The production by British Railways of the first range of standard new vehicles described in the article on page 250, following closely on the appearance of the first new standard locomotives, is an event of importance. The traveller judges a railway largely by the coaches that are provided for his transport, quite apart from the speed, frequency or relative punctuality of the train service.

On the whole I think passengers will agree that the new vehicles are attractive. Revolutionary changes in design were not to be expected in view of the high standards reached in the modern stock of the former separate companies and the present need for economy. British Railways have aimed at incorporating the best practices of each former railway company together with a number of new features. It is interesting to find that the traditional British side-corridor vehicle is still favoured, five of the twelve new designs being of this type. On the other hand, four of the new types, including of course the restaurant cars, are of the open centre-corridor variety. In two of these, one for each class of passengers, separate chair-type seats are used. In the "chair cars" one misses the familiar luggage racks, but their omission does give a more free and spacious look to the interior of the vehicles.

This Month's Special Articles

	Page
Belfast to Cork by *"Enterprise"* .. by W. A. Ryan	242
Britain's Changing Coastline .. by Arthur Gaunt, F.R.G.S.	244
Magnifying 100 Million Times .. by V. Vand	247
A Real Flying Motor Car.. .. by John W. R. Taylor	248
British Railways Standard Coaches	250
Making a Drystone Wall .. .. by Eric N. Simons	252
Pipeline Round the World .. by John W. R. Taylor	255
Australia's Beach Life Savers .. by Ian Hamilton	258
Wings for Tomorrow	260
Exploring Athens .. .. .. by E. Emrys Jones	262
Chinese Trains were Different .. by Bernard Llewellyn	265

Belfast to Cork by *"Enterprise"*

By W. A. Ryan, G.N.R.(I.)

THE attractive cover to this issue of the *"M.M.,"* prepared from an *"Irish Times"* photograph, shows the through Belfast-Cork *"Enterprise"* leaving Amiens Street, Dublin, in charge of No. 800 *"Maeve,"* one of the 4–6–0 engines of Coras Iompair Eireann. The through running to and from Cork of the train, already well known as a Belfast-Dublin service, is an important development that was briefly referred to in the *"M.M."* of November last.

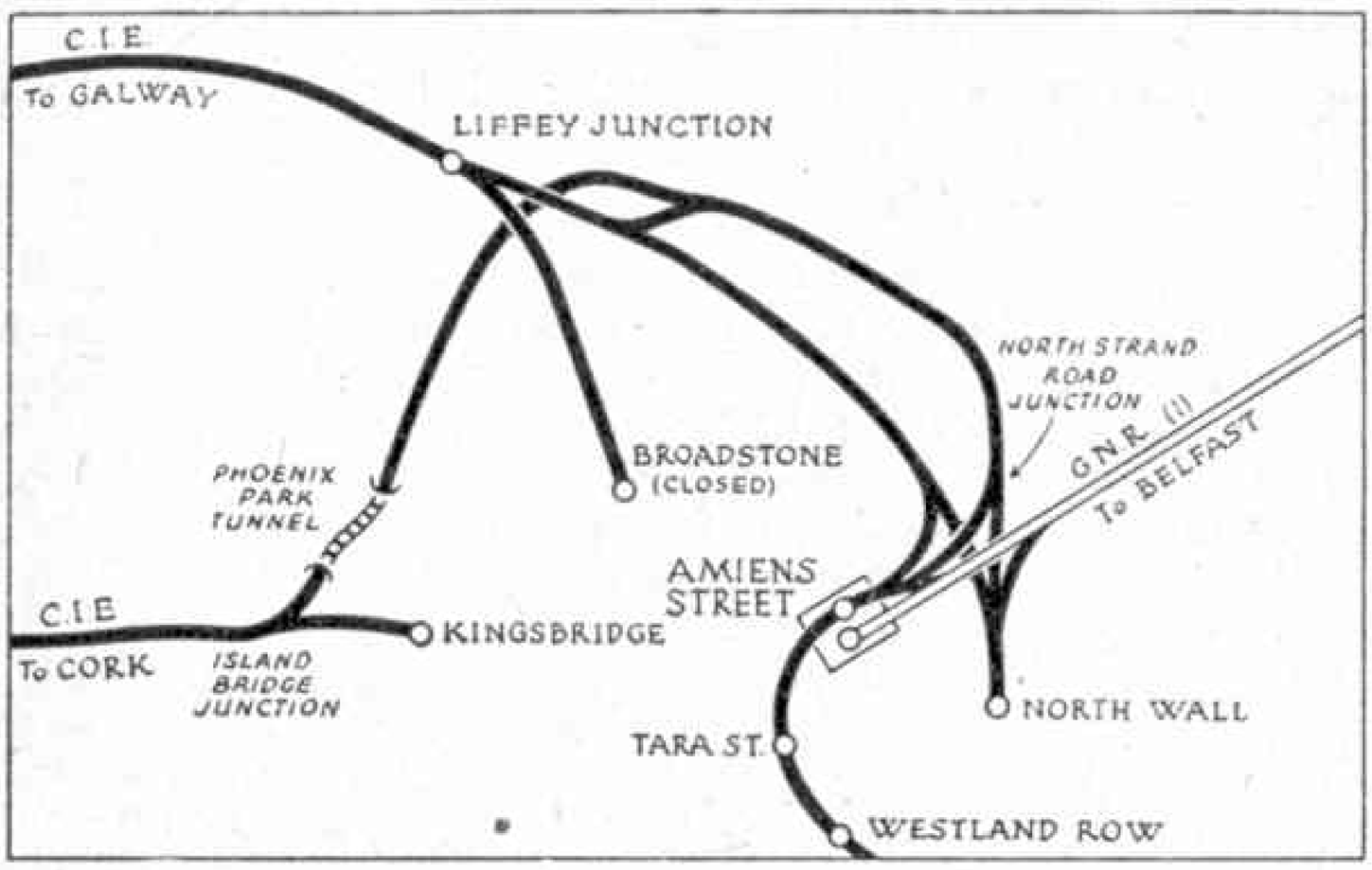
The *"Enterprise"* was first put in operation in August 1947, linking the capitals of Northern Ireland and of Eire in the course of a 112½ mile non-stop run of 2¼ hours. These 50 m.p.h. runs avoided the stops ordinarily made for customs purposes at Goraghwood and Dundalk—yes, the express services of the G.N.R. are actually international and have to cross "the Border"—arrangements being made to carry out Customs formalities at the terminal stations.

The success of the original service, from Belfast in the morning and from Dublin in the evening, led in 1948 to the provision of an additional train of similar character each way; so that there were now departures from Belfast at 10.30 a.m. and 5.15 p.m. and from Dublin at 9.30 a.m. and 5.30 p.m. After a little experience the newer services of 1948 became the 4.45 p.m. from Belfast and 11 a.m. from Dublin.

Since last October the morning service from Belfast has become even more of an international express, serving trans-atlantic travellers, by sea at Cork for Cobh, and by air, via Limerick Junction to Shannon Airport. By close collaboration between the G.N.R. and the C.I.E. the train is handed over at Amiens Street, Dublin, from one company to the other, Cork is reached at 5.10 p.m. The corresponding 1.15 p.m. return from Cork reaches Dublin in sufficient time to take up the running of the original 5.30 p.m. from Amiens Street, arriving at Belfast at 7.45 p.m.

The picture above shows the Belfast-Cork "Enterprise" at Dublin in charge of C.I.E. 4-6-0 No. 800 "Maeve." Photograph by courtesy of the "Irish Press."

The pioneer *"Enterprise"* between Belfast and Dublin provided for the first time in Ireland a regular non-stop run of over 100 miles. When this first service was duplicated it provided four such runs, and the later extension of the morning *"Enterprise"* to Cork and back brought the number up to six. Its 282-mile journey became the longest regular run in Irish railway history, and coming north an average speed of practically 54 m.p.h. must be



A map of the railways of Dublin, showing how the through "Enterprise" is worked between the G.N.R. and the C.I.E. main line routes. The illustrations on this page were supplied by Mr. Ryan.

made over the 102.5 miles from Limerick Junction to Clondalkin.

The remaining *"Enterprise"* services between Belfast and Dublin are now provided by diesel-powered railcar units that were described in the special article in the *"M.M."* last September. At the moment the steam-hauled *"Enterprise"* bound for Cork leaves Belfast with a seven-coach formation, G.N.R. stock being used in each direction. A centre-corridor brake-third next to the engine is followed by three centre-corridor thirds. Then comes the buffet car, one first class side-corridor coach and one side-corridor brake first. The total weight of the train is 206 tons empty.

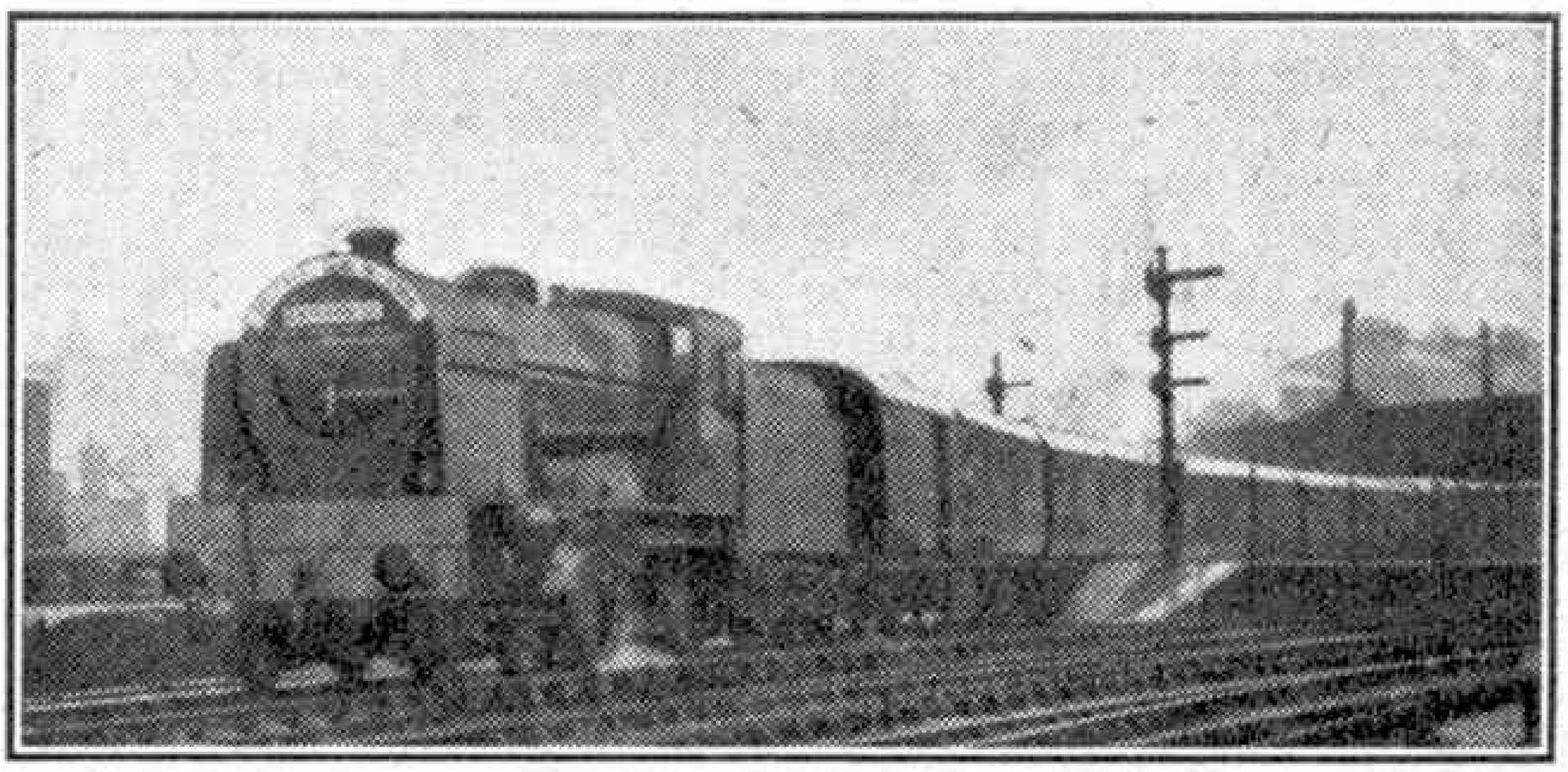
The teak coloured vehicles make a handsome train behind the brilliant blue G.N.R. engines or the more sober olive green C.I.E. ones. The distinctive name and destination boards carried by the engines are well shown in the illustrations, while with the exception of the buffet car the coach boards read alternately *"Belfast-Dublin-Cork"* and *"Enterprise"* respectively.

Although G.N.R. trains are operating the whole of the through service at the moment of writing, it is anticipated that when sufficient new standard C.I.E. vehicles are ready a train of these will be running in turn with the G.N.R. stock. The new C.I.E. vehicles are similar to the existing steel-panelled stock introduced in 1935, but include detailed improvements. Their plain dark green finish is distinctive and is relieved by aluminium strips round the windows.

Between Belfast and Dublin the train is in charge of one of the G.N.R. 4-4-0s, either one of the familiar Compounds named after birds, or one of the more recent three-cylinder simple "River" series such as is shown in the lower illustration on this page. Between Dublin and Cork C.I.E. motive power is used, and although the big "800" class three-cylinder *"Maeve"* appears in one of the accompanying photographs and on the cover, C.I.E. engines of the older Great Southern "400" class have been used.

Out of Belfast gradually rising grades face the southbound "Enterprise" at first, and then gentle ups and downs terminate in a two-mile climb that finishes about a mile short of Kilmore box. The tendency of the line is to fall to Portadown, and at the Border station of Goraghwood to rise steeply up the Wellington bank in the Mourne Mountains of County Armagh to the summit of the line, which is in a deep rock cutting 522 ft. above sea level.

Down the other side lie the 11 or so miles to Dundalk, scene of many a high-speed exploit. Kellystown bank is the next principal obstacle; then the line runs down into the (*Continued on page 286*)



The Belfast-Cork "Enterprise" leaving Belfast on its first trip. The engine is G.N.R. 3-cylinder simple 4-4-0 No. 206 "Liffey."

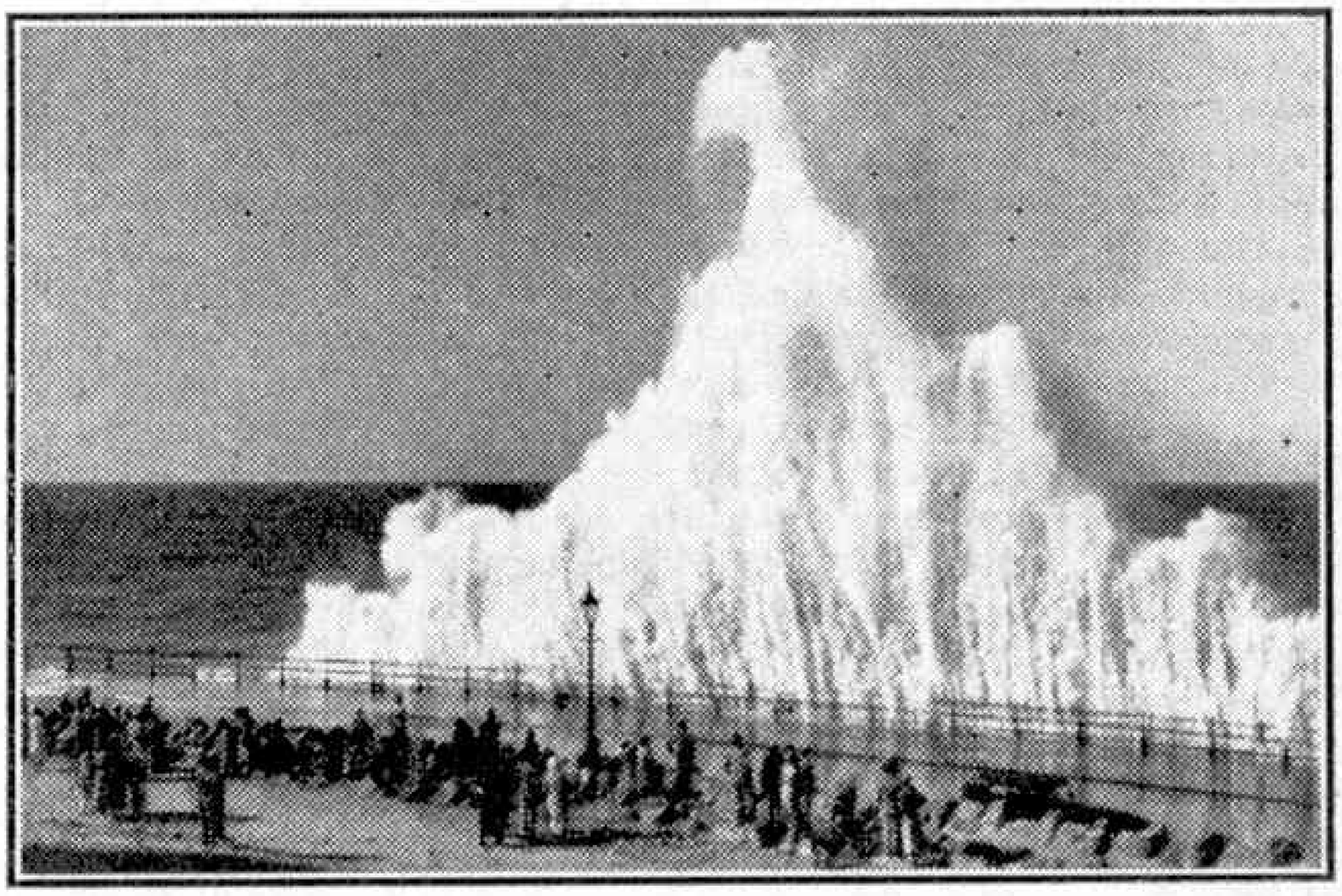
Britain's Changing Coastline

By Arthur Gaunt, F.R.G.S.

ALL round the shores of the United Kingdom the amount of damage caused by the sea during the winter months is now being assessed, and scores of thousands of pounds will shortly be spent on engineering projects to combat further erosion.

The threat of inroad by the waves is not confined to low-lying parts of the coastline. It is equally serious along the stretches bounded by high cliffs. One of the largest falls of cliff for many years occurred in November last at Robin Hood's Bay, Yorkshire, where more than 1,000 tons tumbled in a single night.

The Norfolk coastline has been receding for many years, and to-day there is increasing concern lest the menace get out of hand. Indeed, it has been authoritatively stated that unless urgent and extensive protective measures are taken, the "bulge" that makes that county so conspicuous on our maps will soon vanish. The threat has already materialised at some points, and houses and other buildings that formerly were some distance from the sea are now on the cliff edge. Several have tumbled and been swallowed by King Neptune.



A gigantic wave striking the sea wall of the Marine Drive, Scarborough.

Pakefield, in Suffolk, has suffered greatly in this manner during recent years, and some of our big resorts and seaports have not escaped serious damage from the sea. Lowestoft spent £250,000 on building a massive sea wall just before the war, but in less than 10 years it was breached in several places.

Even our great headlands, with their solid rocks, have not escaped erosion. Striking proof of this can be obtained by comparing the shapes and sizes of offshore rocks year by year. At other places the shore is being eaten away at the rate of 15 yards a year.

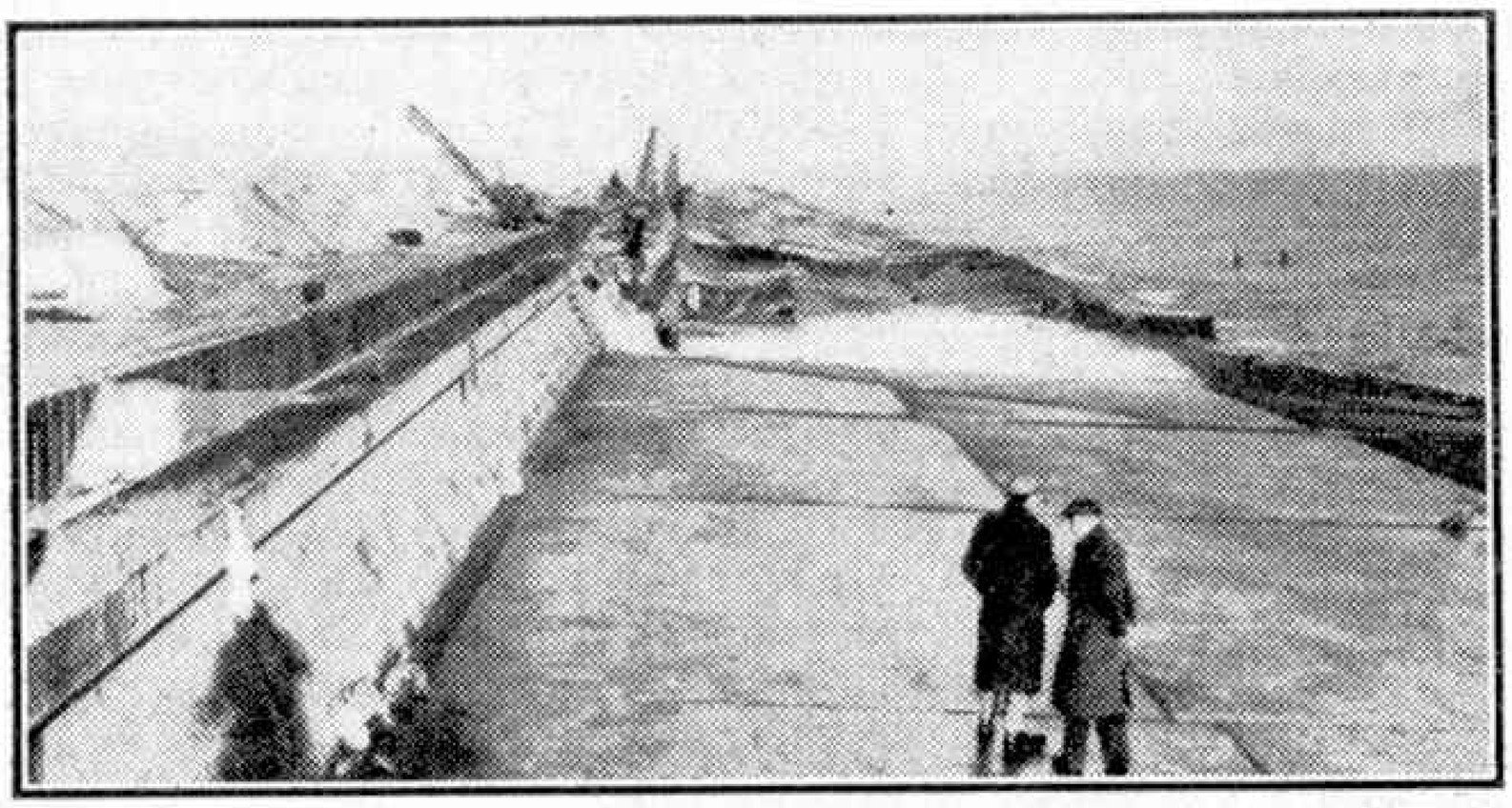
When old maps and documents are consulted the position is seen to be even more alarming than this suggests. Some towns and villages marked on ancient maps cannot now be found, having been completely overwhelmed! Other places, though they do exist, are to-day but shadows of their former flourishing selves—thanks to King Neptune.

Dunwich, in Suffolk, and Ravenspur, Yorkshire, are classic examples. Dunwich was an early centre of Christianity in England, and the town grew until it had a royal residence, a bishop's palace, 52 churches and many shipyards. Then, about the year 1300, the sea began to nibble at the coast here, and in 50 years Dunwich was reduced to half its size by inundations. The waves swept in relentlessly, submerging many of its churches and making the town unusable as a port. To-day it is almost completely shorn of its ancient glory, and has become just a quiet coast village. Within the last 30 years, indeed, it has dwindled further. The last remnants of one of its old churches collapsed into the sea in 1920.

The story of Ravenspur is still more astonishing. Shakespeare mentions the place, which was a thriving port with an annual fair lasting 30 days. The town had two Members of Parliament, and from its harbour Edward de Baliol sailed when he invaded Scotland in 1332.

Yet even the site of Ravenspur is now

uncertain! It has disappeared under the waves, and the only clue to its position is given by old maps, which are probably inaccurate. The same maps show other places in the Holderness area that cannot now be located, Orwithfleet, Auburn and Withow, for instance.



Steel foundation piling for a new sea defence wall being driven behind the ruins of the old North Wall, Lowestoft, which was broken up by the sea.

With these lessons in history to spur them, it is hardly surprising that increasing attention is now being given to the building of sea walls, groynes, breakwaters and other engineering works that will prevent our shores from being washed away in this twentieth century as they were in earlier times.

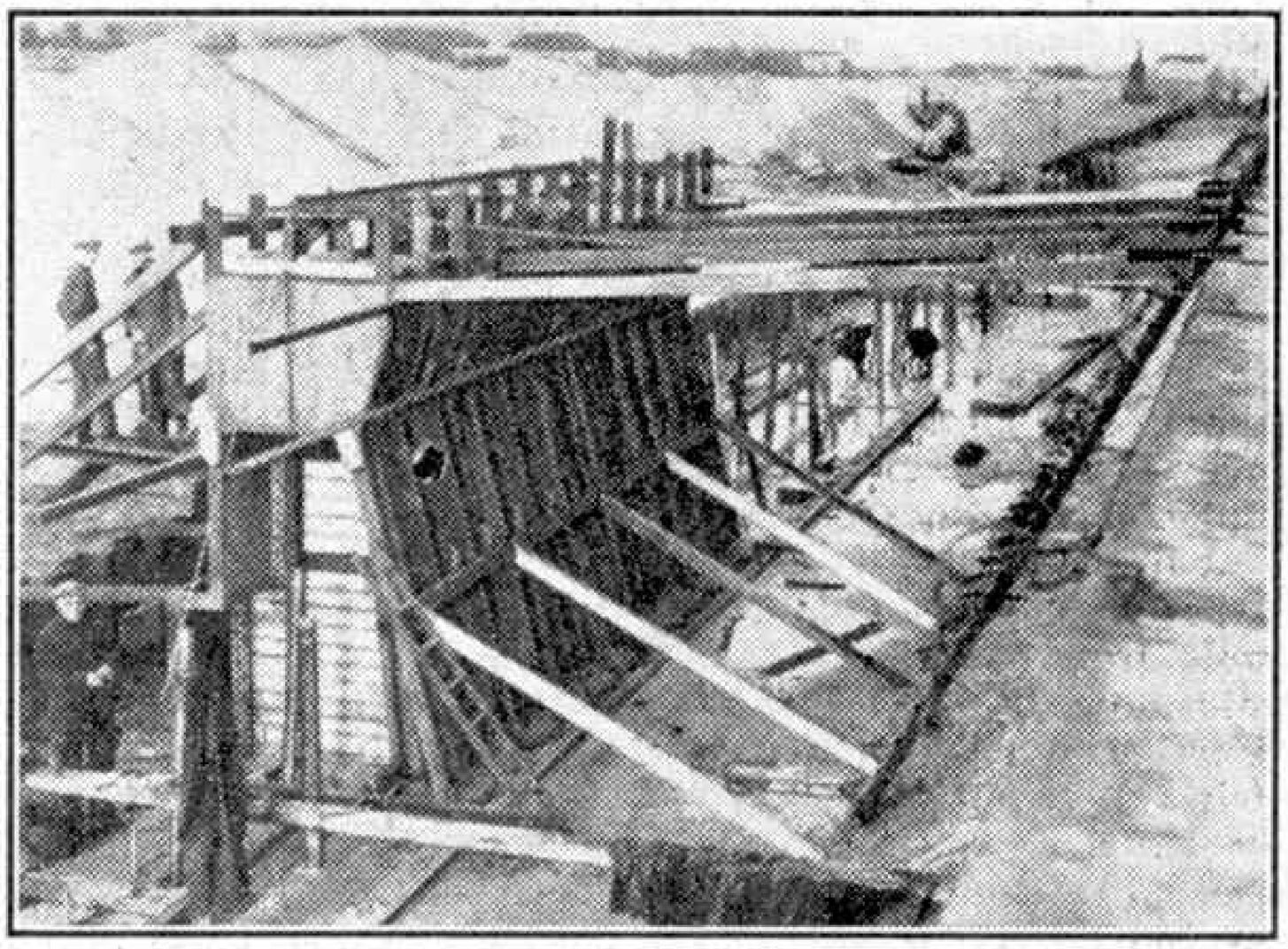
Though the cost of fighting the sea until fairly recently had to be borne chiefly by individual towns along the coast, such work is now being increasingly recognised as a task for the whole country. In 1946 the Government made a rapid but comprehensive survey of the menace to our shores, and more than 3,000 miles of coastline were carefully examined. Parliament has since set aside £2,000,000 for coastal protection, and much more than this will eventually be spent on sea defences.

This will not be money ill spent, for it will prevent the loss of land useful for farming, and in the long run some tracts may be won back from the sea. Lessons learned during the war, when harbours were extended and new ones built, will show how the battle against King Neptune can be fought successfully.

New methods of building seawalls are being tried on a small scale, but until the value of these is proved our civil engineers are pinning their faith on massiveness in constructing the defences. They say they can build seawalls capable of resisting waves powerful enough to dislodge granite blocks weighing 40–50 tons, which means that these structures will resist a peak pressure of four tons per square foot.

To combat erosion, not only are strong sea walls needed, but the beach itself must receive attention, too. A good beach, built to retain the shifting sands by means of groynes, is the first line of defence.

The modern method is to insert steel piling into the sand to a depth of at least 12 ft., and then to build behind these a horizontal "toe" or shelf of concrete leading to a concrete sea wall. At Lowestoft, 20 ft. steel piling has been driven into the beach. The driving equipment consists of pile driving frames from which are suspended No. 6 McKiernan Terry hammers. Each hammer weighs 3,000 lb. and is raised and controlled



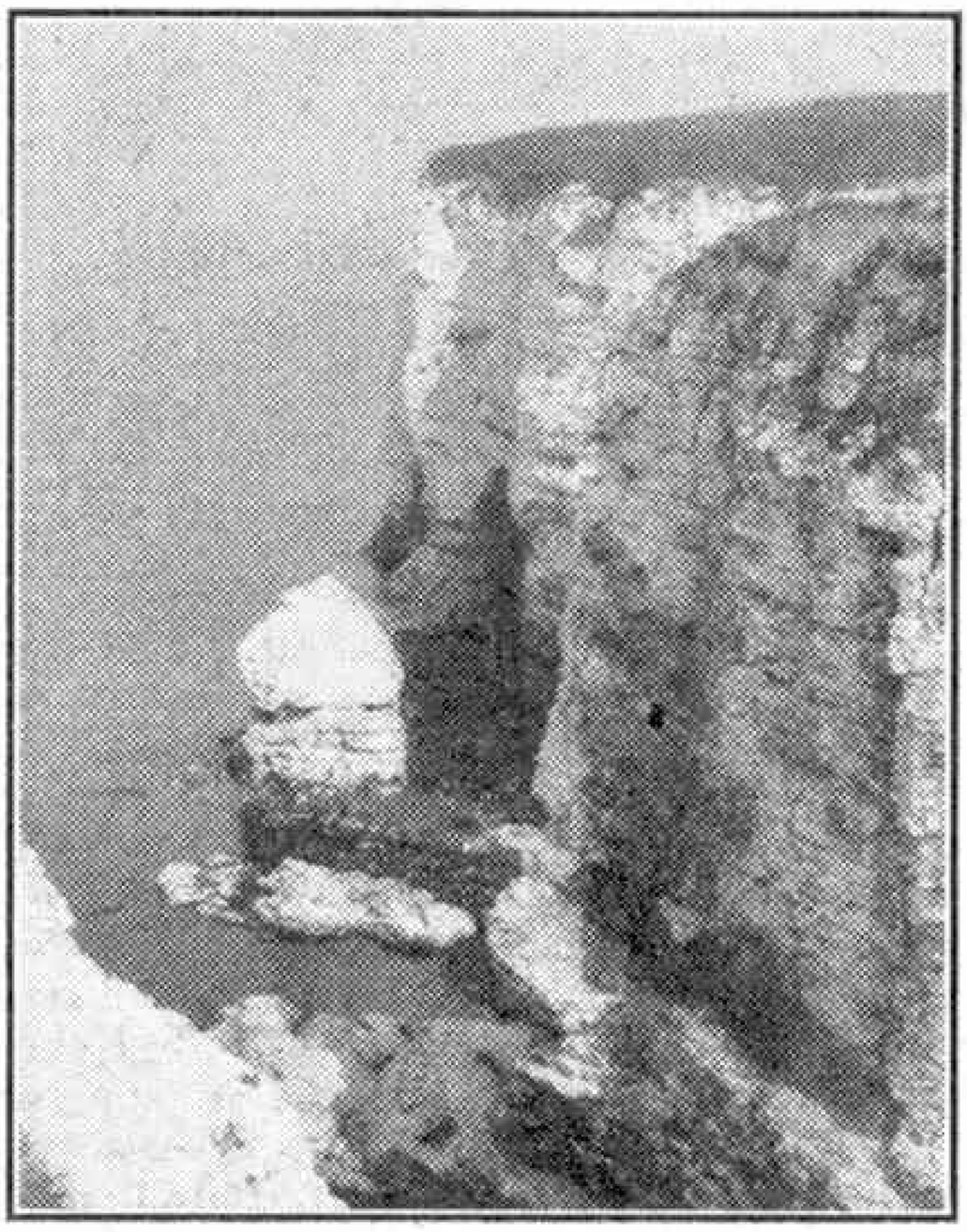
Shuttering in position, ready for casting the first section of the new North Wall at Lowestoft. The old wall can be seen on the right.

by a twin-drum winch. The advantage of having two drums is that while the hammer is supported by one drum the other can be prepared to hoist the next pile.

The driving rate varies, but is usually about one 20-foot Larssen pile each hour. Drag line equipment, with buckets holding 8 cu. ft., has been found invaluable for excavation work, especially along the East Coast, where the North Sea, its waters unable to escape quickly through the English Channel, piles its waves against the shore.

In Yorkshire alone no less than 80,000 acres have vanished as a result of attacks by the sea since Roman times. This is a greater area than that covered by the whole of the County of London!

Cornish legends refer to the lost land of Lyonesse, which once stretched from Land's End to the Scilly Isles, and there is an increasing belief that it did exist. Soundings have revealed that the sea bed between Penzance and the Scillies lies only 50–60 fathoms deep, and a plateau or terrace stretches westwards under the Atlantic Ocean from Land's End.



The rock, near Flamborough Head, seen in the centre of this picture had disappeared two years after the photograph was taken.

Old records refer to large numbers of trees being washed up on this stretch of coast, so there is good reason to believe that a fertile, populated region existed there at some period. Later it was overwhelmed, perhaps by a sudden upheaval of the sea floor.

Lancashire has a similar tradition which tells of a now submerged village about a mile from the shore at Blackpool, on a site now marked by Pennystone Rock. Further north, scientists in 1950 sought relics of a port that existed on the shore of Morecambe Bay in Roman times, and 200 years ago there were busy wharves at Sunderland Point, south of Heysham Head. In recent years, the building of a great sea wall, 90 miles long, has been envisaged to protect the Lancashire coast from changes as a result of the ravages of the waves.

There is, of course, another side to this somewhat alarming picture of a dwindling Britain. At some points the sea has actually returned land. Yet even this reclamation is not always a blessing. It is just as likely as erosion to render a port useless, by silting up the channels and preventing ships from reaching the wharves and docks. Of the Cinque Ports that flourished on the South Coast in the Middle Ages, only Dover is of much use to-day. Rye, Winchelsea, and Pevensey have declined as the sea has retreated from them. It was at Pevensey that the Normans landed in 1066, and not at Hastings.

On the Lancashire Coast, not only did the sea leave the port at Sunderland Point, but further north on the fringe of Morecambe Bay there is Milnthorpe, which once had shipyards. Only scanty remains of these can be found to-day.

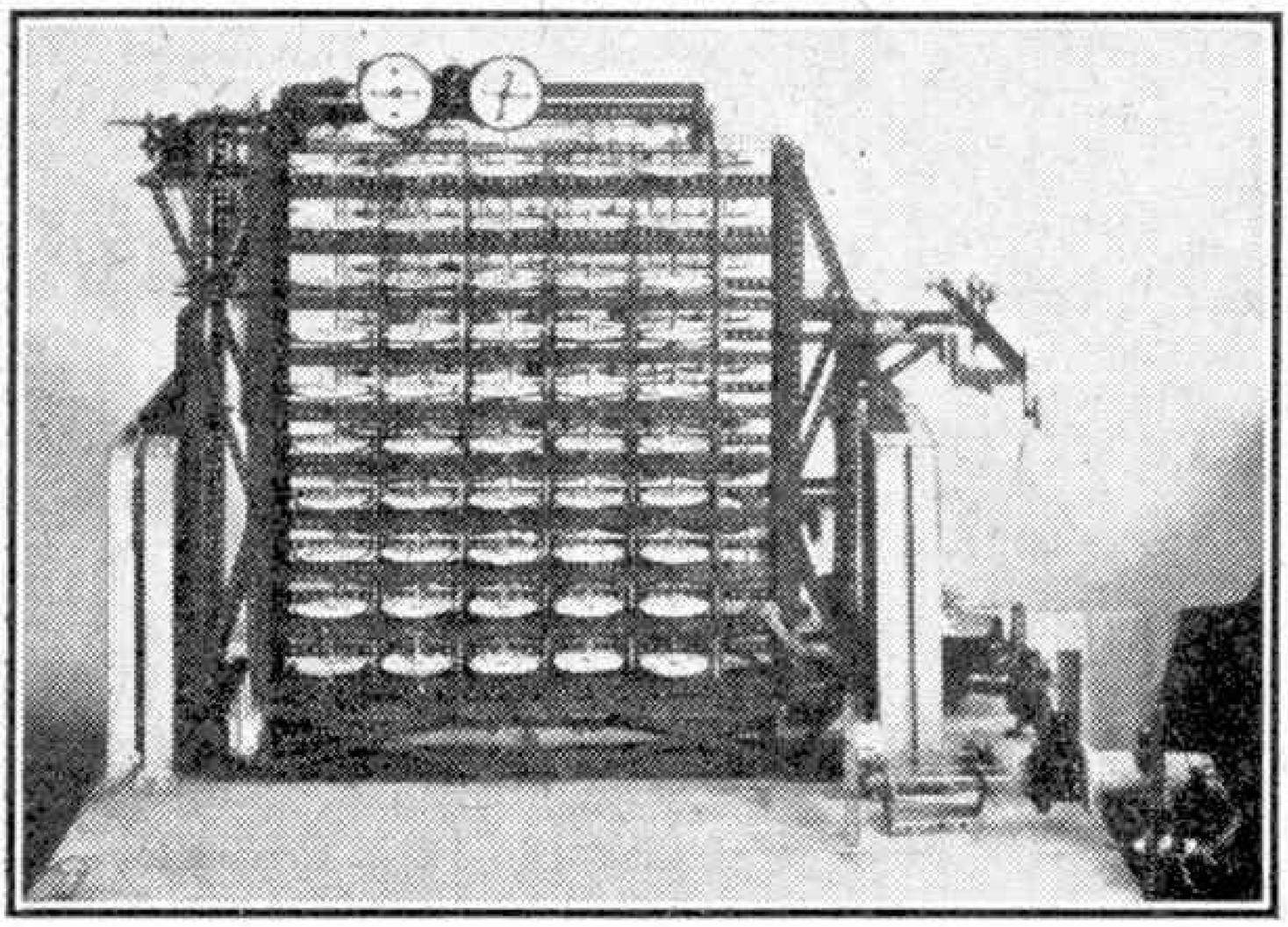
Artificial schemes have been suggested to reclaim other tracts, mainly dunes, mudflats and marshes, and some projects of this kind have already been carried out. Rice grasses have been found excellent as a means of effecting such reclamation. They spread quickly, and their network of long roots binds the liquid mud together, while the coarse growth above the surface traps the silt left by the tides. Thus the level of the land is raised, and in time the region becomes suitable for grazing and other farm activities.

At some places marshland reclaimed in this way has become solid enough to bear houses and factories. Some of the docks at Southampton and on Tees-side are on sites formerly waterlogged and insecure. Firm foundations have been provided by enlisting the help of grasses and encouraging silting.

Magnifying 100 Million Times

By V. Vand

LET me explain first how an ordinary microscope works: A small object is placed in a beam of light. The object scatters light in all directions, and if one places a lens to collect the scattered light, a magnified image is obtained. An ordinary microscope cannot magnify more than about 3 000 times because no matter how perfect the lenses, one cannot see sharply by means of light any objects smaller than the light wavelets.



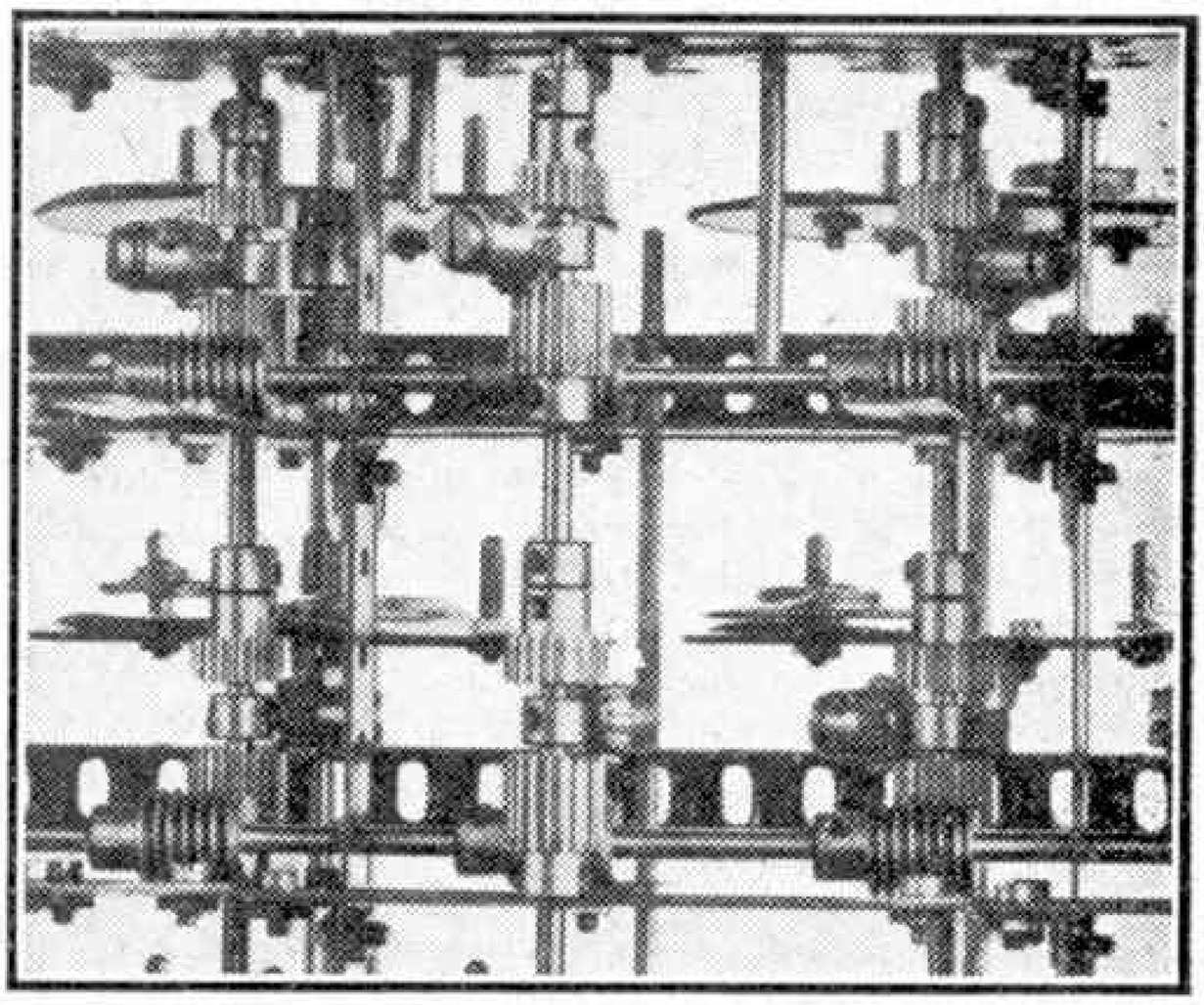
A machine built of Meccano parts that automatically builds up a picture of atoms with a magnification up to 100 million times.

An electron microscope can magnify about 100,000 times, but our ambition is to see individual atoms, for which magnifications of several million are required. Wavelets of X-rays have just the right length to show the atoms, but there are no known X-ray lenses that would work. However, there is a roundabout way of constructing an X-ray microscope. In a crystal of a substance to be investigated all the molecules are neatly arranged in it in rows, rather like a wallpaper pattern. The crystal is placed in a beam of X-rays, and a photographic plate is placed where one would normally insert a lens. The X-rays scattered by the crystal then form a pattern on the photographic plate, which can be measured point by point. From these measurements the magnified image is reconstructed mathematically in the same way as a lens would have done it. Actually, the lens in a microscope really works as a marvellous calculating machine, which adds all the wavelets of light correctly together and so forms an image.

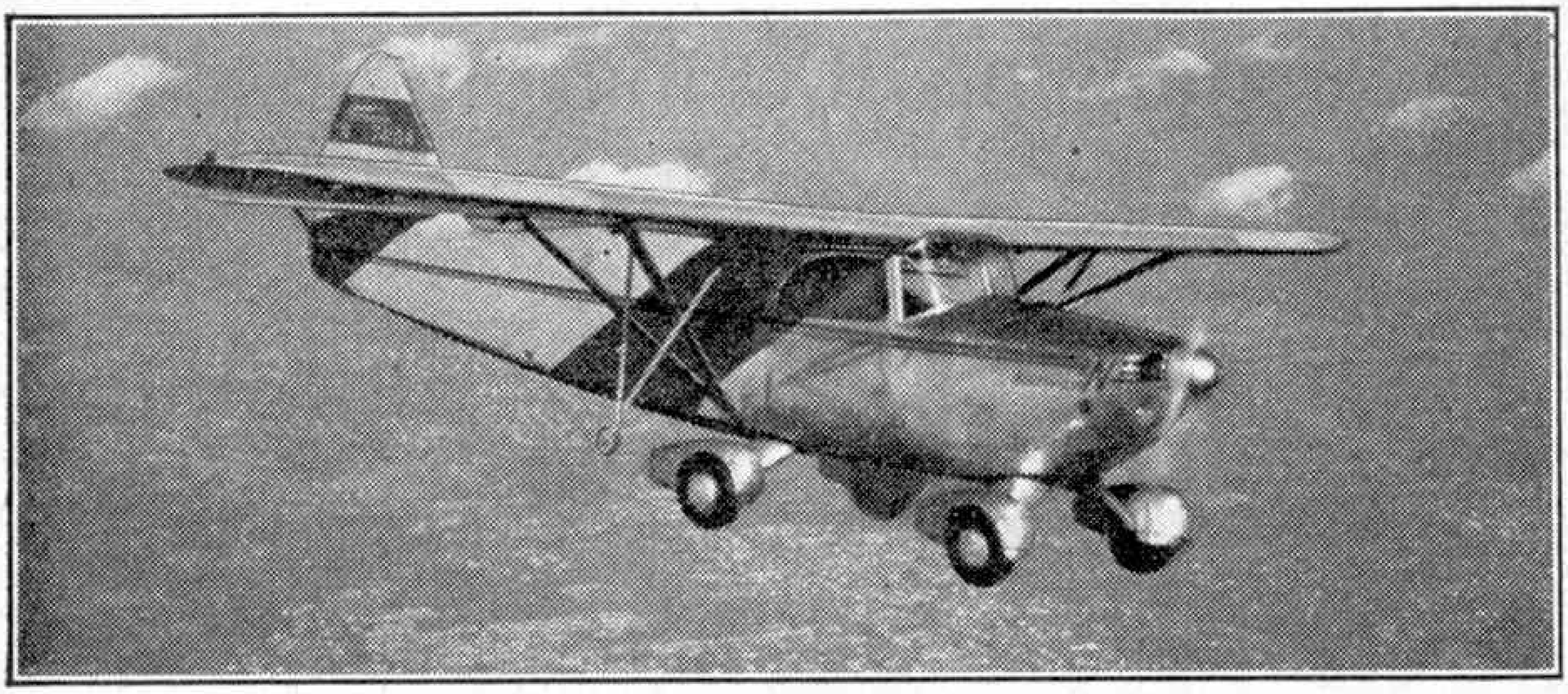
Although the wavelets of our X-ray microscope can be added together by calculation, this is a very laborious way to do it. In the U.S.A., an electronic machine has recently been built, by Pepinsky, that sums up to 800 wavelets electrically and displays the magnified picture of the atoms and molecules on a television screen. Such a machine is very expensive, however. A much simpler mechanical machine has been constructed almost entirely of Meccano components which is capable of summing up to 100 wavelets. It is shown in the accompanying photographs. The first machine of this kind was built in the Research Department, Lever Brothers and Unilever Limited, Port Sunlight, and a second machine has been built in Glasgow University.

Now how does this work? The whole machine swings freely on two knife-edges and works as a balance. There are 100 units, 50 on each side of its frame, each unit consisting of a gear which carries an offset weight. The whole of the frame is really only a big gear-box, which turns the loaded gears at speeds of 1, 2, 3, ... 99, 100 revolutions for each cycle of the machine. As the gears turn, the weights throw the frame of the machine out of balance. This is restored by shifting a rider, and the position of the rider indicates the sum of all the displacements of the weights. As the weights go round the result is mathematically the same as the sum of the wavelets produced by a microscope lens.

In using the X-ray microscope a crystal is placed in the X-ray beam and a photograph of the scattered radiation is taken. The strength of this radiation is measured at 100 points of the photograph. The resulting figures are set as weights into the 100 units of the machine, each weight depending on the strength of the scattered radiation at a particular point of the photograph. At the beginning of the run, each gear must be set at the correct angle, as it does matter in which order the crests of the wavelets combine to form the image. The machine is then started and as it runs it calculates the image of the molecule point by point. The final result is obtained in the form of a map, peaks representing the atoms by contour lines just as hills are shown on maps.



A close up view of parts of the machine, showing some of the 100 differential gears of which it consists.



A Real Flying Motor Car

By John W. R. Taylor

THIRTY-NINE years ago this month, when aeroplanes were still unpredictable contraptions of stick and string, an inventor named J. Gavura patented in America an odd-looking vehicle with four wings, five propellers, four wheels, and a fuselage shaped like the hull of a small motor cruiser. He called it a "combined flying machine and automobile," but it did not fly and was never seen on the roads.

Nevertheless, Mr. Gavura had the right idea. He could see that half the benefits of aviation were lost if a pilot could fly only between large open spaces miles from anywhere. What was needed was an aeroplane that could travel from door to door and be kept in a garage between times.

His idea has since been resurrected by scores of designers including the great Glenn Curtiss, but none of their flying motor cars worked satisfactorily. As a result, the whole idea was condemned by the experts as a practical impossibility. But they reckoned without the engineering genius and skill of a young American named Robert Fulton.

During the war, his company built training equipment for fighter pilots, and he spent much of his time flying all over the United States, covering hundreds of miles from airport to airport as quickly as he could have travelled a few dozen by car.

Unfortunately, he often found that all the advantages of flying vanished as soon as he landed, because the aeroplane that had carried him so far, so fast, left him stranded on some remote airfield.

Scores of times Fulton longed for an aeroplane that could be driven off the airfield, down the road to his destination. Finally, as nobody else seemed likely to produce his dream of a flying motor car, he decided to build it himself. There were obvious problems in the design of such a machine, but none of them seemed insurmountable. Reduced to essentials, an aeroplane needs an engine to drive it, controls to steer and stop it, wheels to support and move it on the ground and a comfortable cabin to sit in—all of which are also the basic essentials of a motor car. Only the addition of a propeller, wings and tail makes an aeroplane radically different from a motor car and prevents its being driven down a road. So, argued Fulton, why not leave these pieces behind at the airport?

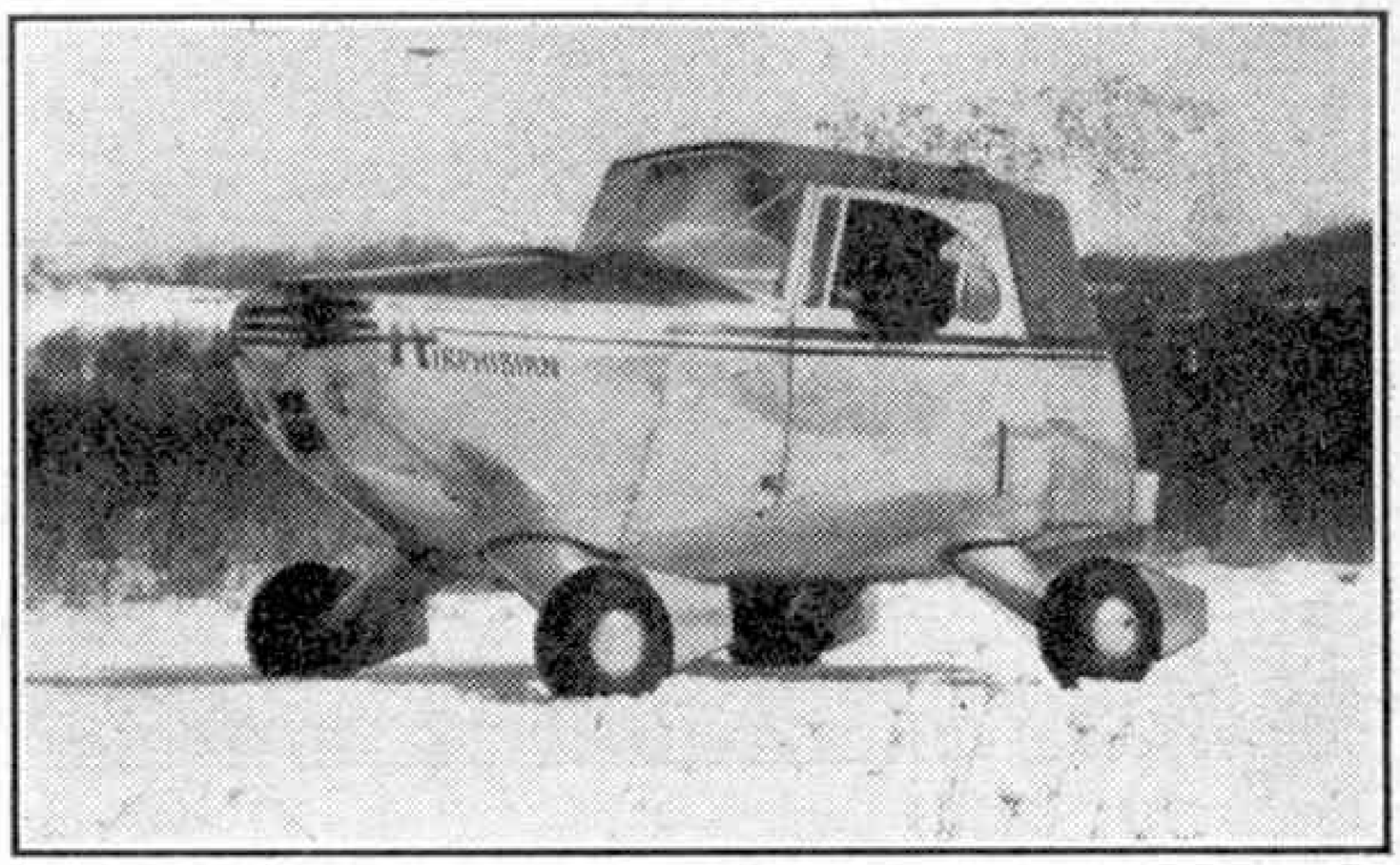
The photograph at the top of this page shows the Fulton "Airphibian" in flight. The illustrations to this article are by courtesy of Continental, Inc., U.S.A.

The essential was to combine in one vehicle a conventional flying machine and a conventional driving machine, avoiding complications such as a tailless aeroplane, pivoting wing or three-wheeled car, which had killed so many promising earlier projects. Nor would he be satisfied with either a second-rate flying performance or a second-rate road performance as the price of versatility. The transition from aeroplane to car had

to be sure and quick, so that it could be accomplished by one person in five minutes without special tools. Cruising speed had to be at least 100 m.p.h. in the air and 45–50 m.p.h. on the ground. Operating costs had to be such that it would save not only time and temper, but money too.

Experienced designers told Fulton that it was impossible to achieve such high standards—his machine would have to be either a good aeroplane and not-so-good motor car, or *vice versa*. He couldn't have it both ways. But Fulton was not discouraged, and when his "Airphibian" flew for the first time on 7th November 1946 it certainly *looked* right both as a 'plane and as a car. Now, with three prototypes flying, and well over 200,000 flying and driving miles in their log books, the "Airphibian" has been accepted as a thoroughly practical flying motor car, and the first ever to receive an unrestricted Certificate of Airworthiness.

In the air it looks little different from any other American light aeroplane, the only clue to its versatility being the four neatly-streamlined main wheels and two small outrigger wheels under the wings. Minus wings, propeller and tail, it becomes a rather odd-looking motor car; but it works just like any other car and is perfectly safe and efficient on the roads.

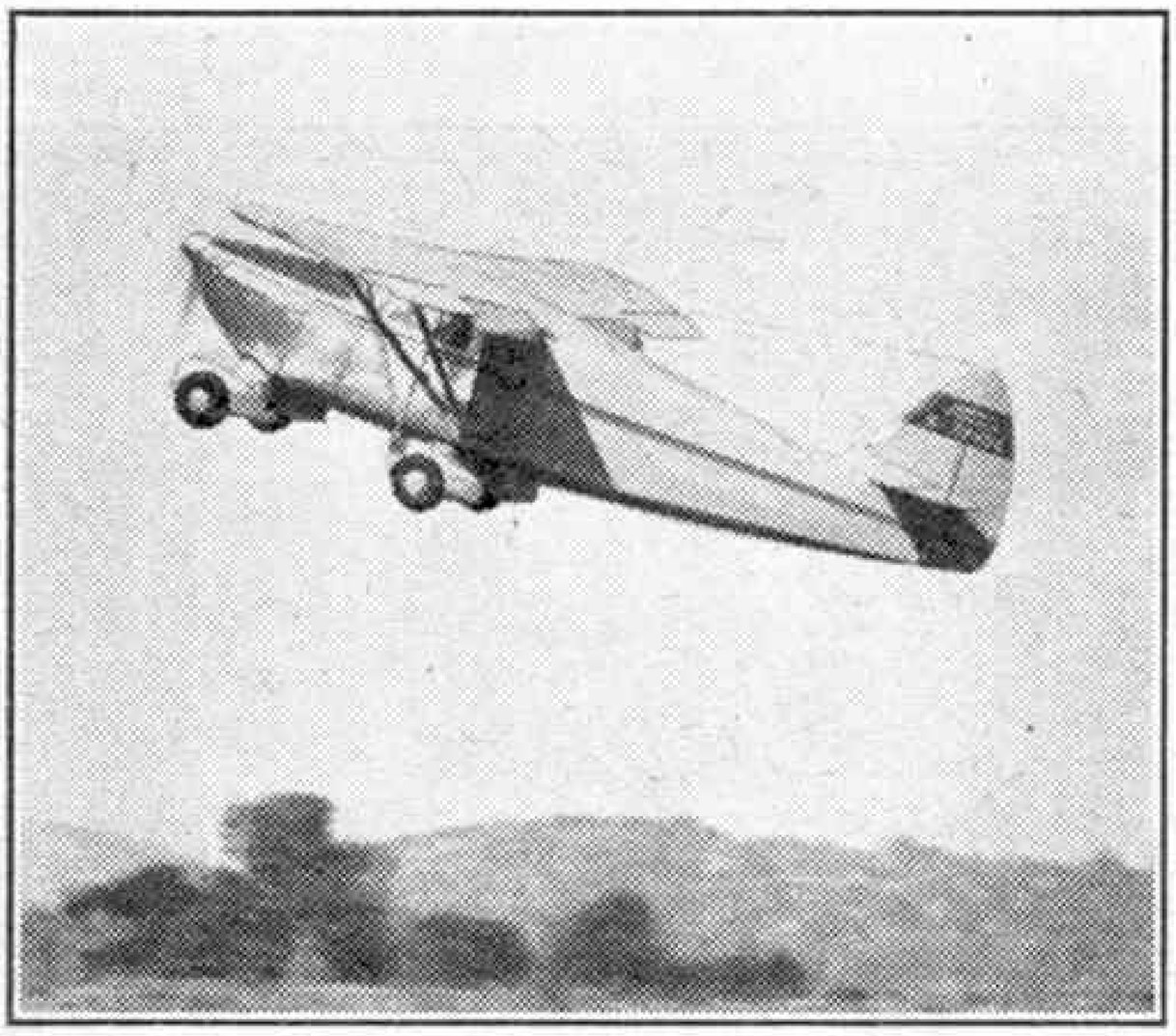


The road portion of the "Airphibian." Prototypes were converted from air to ground version and vice versa 6,000 times before production was started.

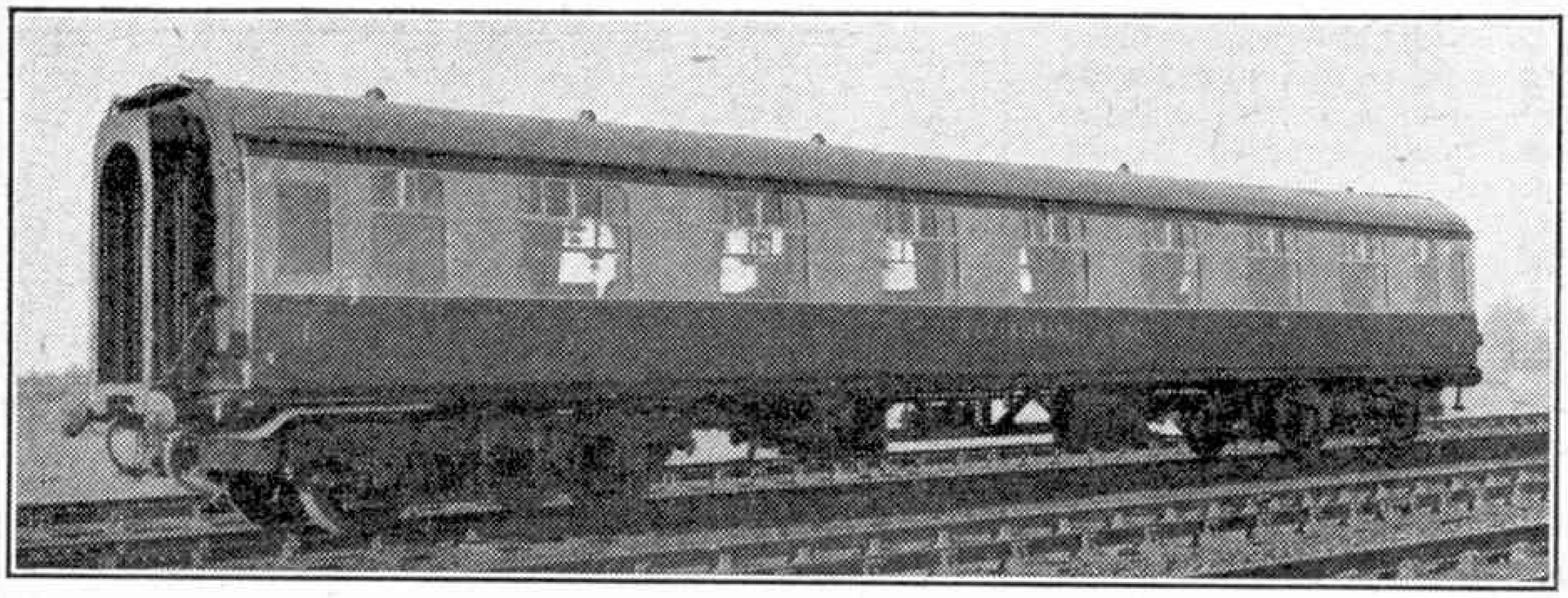
Conversion from aeroplane to car takes just three minutes. The wing-rear fuselage unit is first unlocked and rolled away on the outrigger wheels. Then the three-bladed propeller is removed and fastened to a boss on the side of the rear fuselage, leaving behind the two-seat aluminium-bodied coupe. There is a complete automatic hook-up of all flight controls; a car-type steering wheel is used both on the ground and in the air, and the right rudder pedal becomes a foot brake for road travel. Separate handbrake, accelerator and gear lever for forward and reverse speeds are provided, and road equipment includes an electric horn, combined headlamp-landing lights, rear bumper, rear-view mirror, tail light and sun vizors. There is a big luggage compartment behind the seats and additional space for small items like maps, valises and cameras beneath them.

To ensure safety when the car is converted back into an aeroplane, special built-in electric switches prevent the 150 h.p. Franklin engine from being started until the wing-fuselage unit and propeller have been securely locked in place.

Fulton has proved the capabilities of his "Airphibian" scores of times, but one of the most interesting demonstrations occurred when he brought the prototype to Britain in 1948, to take part in the "*Daily Express*" Air Display. Another American visitor, hearing that a little 13-year old girl was dying of tubercular meningitis in Stafford and that her parents could not buy any streptomycin to (*Continued on page 286*)



Another view of this two-seat roadable aeroplane.



British Railways Standard Coaches

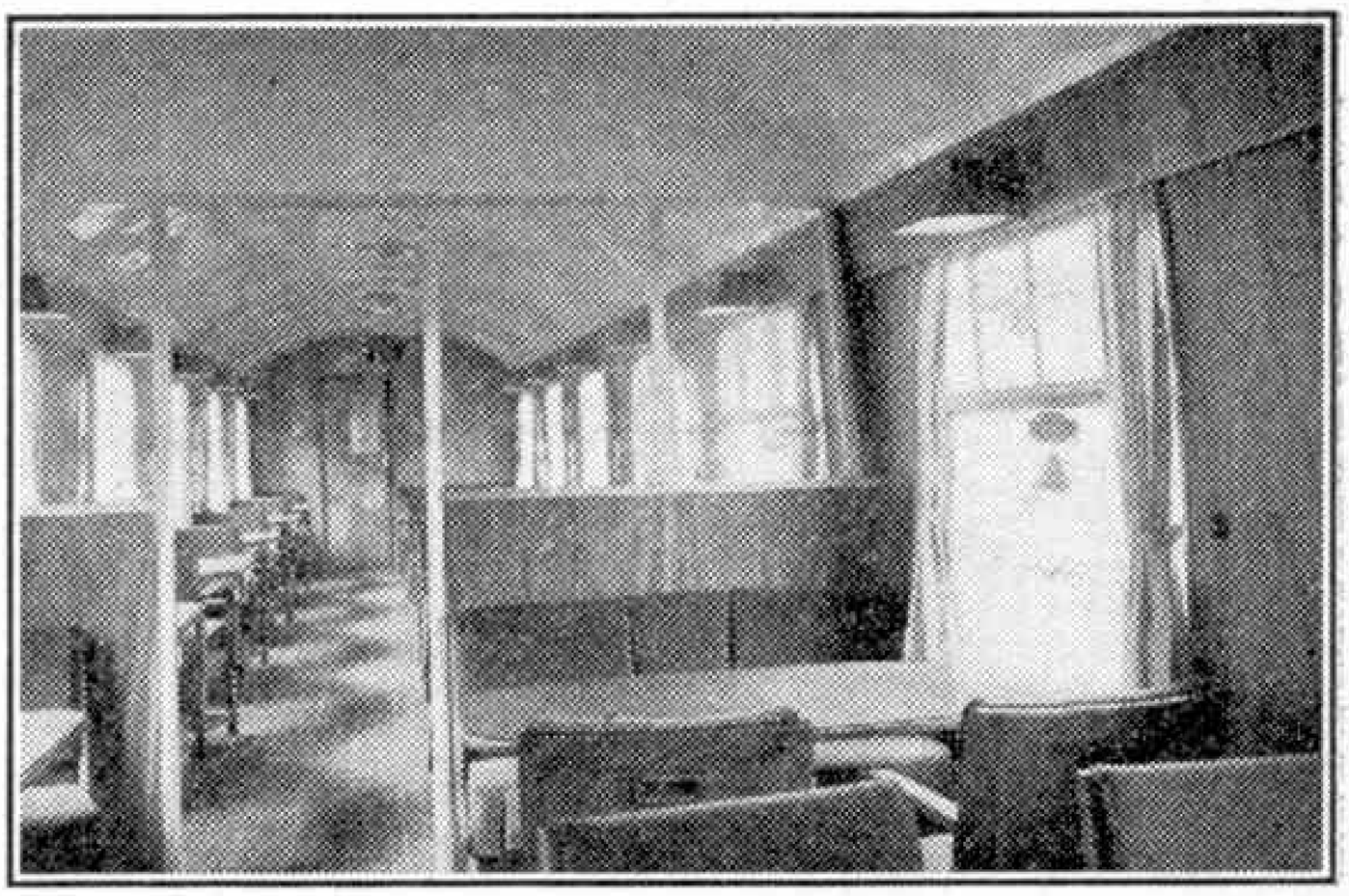
TWELVE different types of British Railways new standard main line coaches are being built this year, and one of the principal features in their design is that their dimensions enable them to run freely over all routes of British Railways. A new design of underframe and all-steel construction gives increased strength over existing vehicles. The new vehicles are designed to common dimensions, and the body structure, underframe and bogies are the same in each type. The standard length is 64 ft. 6 in. over body and the maximum width is 9 ft. The kitchen cars in the programme built to these dimensions are the largest vehicles of this type running on British Railways.

External features of note include bow ends and the use of automatic centre couplers. Bow ends reduce the distance between individual vehicles to be bridged by the Pullman-type vestibules, while the latter in themselves, in conjunction with the centre couplers, form a safety measure. So that the new stock can be coupled to existing coaches having ordinary screw couplings, the automatic couplers are of the drop-head type and the side buffers are retractable.

Pressed steel members assembled by welding are largely used in the body structure and every effort has been made to produce attractive interiors. Bearing in mind the need for economy and the necessity for overtaking arrears in construction of passenger stock, the effects generally are pleasing.

The vehicles so far designed represent the first stage of standardisation. The next stage, already well in hand, includes new non-corridor stock for steam and electric services and new sleeping cars.

In the new brake vehicles, the separate guard's compartment is equipped with a desk and cupboard, a food warmer unit and steam heater. The guard has a padded swivel seat and by the use of a periscope can see along the roof in both directions. There are also lockers, light controls, hand brake, steam heat and vacuum gauges. The luggage compartment in the brake composite vehicles is partitioned off from the corridor side by means of wire mesh with sliding doors. The whole compartment can be locked and is under the observation of the guard.



Views of one of the new B.R. standard first-class restaurant cars.
British Railways Official Photographs.

BOOKS TO READ

Here we review books of interest and of use to readers of the "M.M." With certain exceptions, which will be indicated, these should be ordered through a bookseller.

"OXFORD JUNIOR ENCYCLOPÆDIA"
Vol. IV—Communications
(The Oxford University Press. 30/-)

This is one of a series of 12 volumes forming a complete Junior Encyclopædia. Its subject is communications by land, sea and air, by ancient and modern languages, by signs and symbols, by "bush telegraph" and broadcasting.

Many sections deal with communication by the written word, giving interesting information on languages generally, hieroglyphics, books, newspapers and even secret codes. A large part of the volume is devoted to the wonderful story of ships, describing and illustrating vessels of all kinds from the dugout and coracle to the modern liner. The articles on communications by land deal with railways and tramcars, with descriptions of steam, electric, diesel and gas turbine locomotives, railway signalling and so on; while roads, motor cars, and motor lorries also receive full attention. The sections on travel in the air deal with the aircraft themselves, the theory of flying and aircraft engines, with other sections on such matters as airports, airliners and airships.

The volume ranges across practically every country in the world and covers exciting subjects in the greatest variety. With it the eager reader can satisfy his longing for knowledge on topics ranging from pirates and highwaymen to travelling through space; from early efforts at counting to modern navigation by means of radio and radar.

The volume is very attractive, with large size pages well printed on good paper and many half-tone reproductions and drawings, which indeed are so many in number that they occupy about a third of the space in the book. In view of the size and nature of the volume, the price of 30/- is not out of the way.

Other volumes already published are concerned with Mankind, Natural History, The Universe and Recreations, and the series is an ideal one for inclusion in a school library. Individual owners of the Encyclopædia will be able to consider themselves fortunate in the store of interest and exciting knowledge that it contains.

"BRITISH TEST PILOTS"
By GEOFFREY DORMAN
(Forbes Robertson Ltd. Price 8/6)

This fine book is dedicated to "all keen airminded boys and young men," and it is safe to say that they will revel in it. It tells briefly and in intimate style the life stories of 36 leading test pilots in Great Britain. In doing so it also reveals something of the fine courage, unquenchable enthusiasm and great presence of mind that this most dangerous profession demands of those who adopt it. Some of the splendid airmen featured in this book have paid with their lives for their devotion to duty.

The intimate "atmosphere" of the book derives from the fact that the author knows, or has known, all the test pilots of whom he writes, and has flown with most of them. He is able to make us share his affection and high regard for them as, although not a test pilot himself, he is a kindred spirit, with adventure in his blood. His uncle was Sir Ernest Shackleton, the famous polar explorer, and in his school days he was thrilled with ballooning and the early aeroplanes. He was a pilot in the first world war, and later became a gliding instructor in the A.T.C.

The book has a preface by the Rt. Hon. Lord Brabazon of Tara, himself one of the great pioneers of flying, and is illustrated with portraits of the test pilots concerned.

"THE BOYS' BOOK OF CRICKET FOR 1951"
Edited by PATRICK PRINGLE
(Evans. 10/6)

Here we have the 1951 issue of this well-known annual, as widely varied and as intensely interesting as ever. The coloured frontispiece pictures F. R. Brown, England's Leader in Australia, whose captaincy and skill in the field received its reward during the last of the recent Test Matches in Australia, which brought to an end a long period in which victory eluded the English team.

Turning now to the contents, we have articles by such famous cricketers as Norman Yardley, Godfrey Evans, R. T. Simpson and Denis Compton, each dealing with some feature of the game in which he is an expert. There is also a special interview with the Bedsers, the twin stars of cricket, and a talk with Frank Lee, the Test Match umpire, on the part that he and other umpires play in the game. In addition there are the usual stories of cricket at school and in the villages, with records of famous games, including the sensational first Test at Brisbane during the last Australian tour. The West Indian team that won three out of four Tests against England last summer are paid a well deserved tribute, and there are discussions on methods of brightening cricket and on other topics connected with the game.

As usual, the volume is amply illustrated, chiefly by reproductions of photographs, many of them taken during play in important games; and variety is provided by picture puzzles, quiz pages and cartoons.

"THE METROPOLITAN RAILWAY"
By C. BAKER
(The Oakwood Press. 7/6)

The Metropolitan Railway, now the Metropolitan Line of London Transport, was the world's first underground line and it was duly proud of the fact. From the opening in 1863 of its first section, that between the originally planned terminals of Bishops Road (Paddington) and Farringdon Street, it developed until its trains ran from Aldgate out to Uxbridge on its own metals, and even further afield by means of running powers and joint working arrangements. It shared the working of the Inner Circle in London and stretched out into rural Buckinghamshire for a distance of over 50 miles, and at one time contemplated a branch to Oxford.

"*The Met*," as it was popularly known, also helped to link up the various systems north of the Thames with the southern lines, and it gave access from several main line systems to important City goods depots. Virtually, too, it provided the means of reaching London for the Great Central, the last main line to enter the capital. As the Metropolitan moved outward from London, the Great Central, under the same chairman, was extending southward.

The author was himself a Metropolitan-trained man and he has produced an entertaining account of the history and development of the line from its earliest days until absorption into the London Transport organisation. Steam and electric locomotives, rolling stock and equipment are fully dealt with, and there is a two-page sketch map that enables the reader to follow the course and development of the line with ease. The photographic reproductions are full of interest, and a summary of Metropolitan facts and dates, with a table of dimensions of the line's steam locomotives, completes an excellent book.

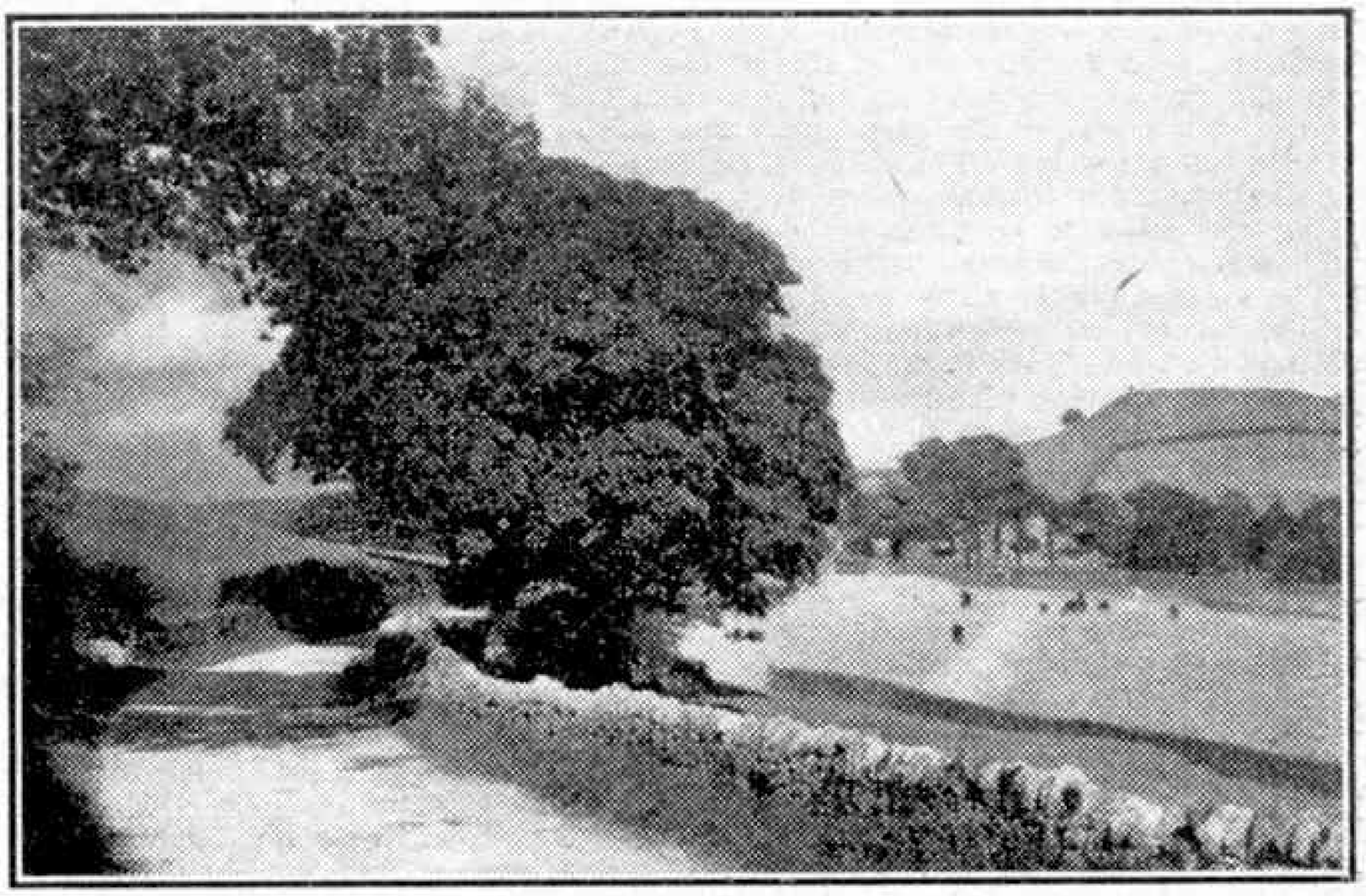
The price quoted above is for the ordinary edition with paper wrapper. The book is also available with cloth binding, price 9/-.

Making a Drystone Wall

By Eric N. Simons

ONE of the most fascinating and interesting of country crafts is the building of a drystone wall. For the benefit of those living in the south, where fields are mainly separated from one another by hedges or palisades, it may be explained that a drystone wall is one built up of loose pieces of stone with no cement or mortar between them. The art is less common than it used to be, but in the millstone grit and limestone districts it is still possible to find expert wallers practising their craft.

The first requirement is a good foundation. The waller digs out a trench about two feet deep the full thickness of the wall, and as long as the wall is designed to be. The good drystone waller shuns cement and concrete, so that the concreting of this trench to provide stability in the foundation, though satisfactory from the practical point of view, is not what one would call a really artistic job. The proper thing is to take good solid blocks of stone, roughly rectangular in shape, and use these as the hidden foundation of the wall. A stick and string are used to give an indication of straightness, and the stones are laid end to end, one edge up against the string. Two such rows are usually enough to give the wall the desired thickness.



Typical drystone wall.

The main requirement of stones for walling is that they should be as flat as possible, and have at least one straight edge; but the really skilled waller can make do with stones of almost any size and shape, as long as they are not too round or egg-shaped.

Having laid a foundation, the waller now begins the actual erection. The wall must taper gradually towards the top, so that when the waller comes to the final row of stones, a single instead of a double row suffices. The line in position, he lays stones side by side with again one straight or nearly straight edge touching the string. This keeps the wall from curving and bending like a letter S, which it will do if he tries to work by eye alone, and will also prevent it from collapsing later. With each successive row the width of the wall is slightly reduced, but not so much as to make a marked step, like the steps of the pyramids. It is a gradual slope back, not an abrupt one.

When he comes to the second row of stones, the waller introduces two principles of great importance. In the first place, he never puts two stones directly one above the other. He makes each new stone hold down two below it, as in laying bricks. This gives the wall greater solidity and strength. Also, at intervals, he introduces a stone running at right angles to the others, so that it covers the full width of the wall. This is known as a "through," and in many ways the through is the most important stone in the wall. It knits together both rows of stones, distributes the weight of the wall more evenly, and again gives greater rigidity and strength. On no account must the throughs be omitted, and if the waller has not suitable stones in his pile, he must delay further operations till he has.

Here is a distinction between the expert waller and the learner. The expert prides himself on never shaping a stone to suit

his spaces. He does not, like the bricklayer or, in many instances, the less expert or amateur waller, knock a chunk off here or chisel a straight edge on a stone that has not one. He makes do with the stones as they come to him, and his skill lies in the speed and accuracy with which, at a glance, he can determine where a particular stone from a random heap will fit. Even after years of experience, the amateur uses far more energy, needs far more trial and error in picking out his stones, than the expert.

Some good examples of drystone walling at Tissington.

Another point must now be stressed. It is a saying among wallers that a drystone wall will stand up as long as the air doesn't get into it. At first sight this remark appears cryptic, but there is, if my theory is correct—and I must point out that it is only a theory of my own—logic behind it. Most drystone walls collapse in winter, during frost. The reason is, I believe, that cold damp air gets into them as a result of the slow weathering and pulverisation of the interstitial stone. Frost accompanies it. The inner stones contract, and therefore tend to slip, because a little smaller, into some crevice or hollow they were too big to get into before. This disturbs the equilibrium of surrounding stones, further weakens the wall, and eventually it falls.

This disintegration occurs eventually to almost all drystone walls, but to retard it as much as possible the interstices between the rows of stones are filled up with small chips and pieces of stone. This gives the wall a solidity it would otherwise not possess, and helps to exclude air. In the end, these small stones crumble and turn to dust, and trickle down deeper into the foundations of the wall, leaving gaps where they were, into which more cold air comes, increasing the weathering action and the area over which it operates.

How a gateway is fitted into a drystone wall.

Anyone who pulls down deliberately a wall of this type that has been up for years will be surprised at the amount of sheer dust he finds, all caused by this slow weathering.

Eventually, the wall approaches completion, and the waller naturally wishes to finish it off as neatly and efficiently as possible. There are various legitimate ways, according to taste. It is regarded as reasonable to cement the top layer of stone into place, especially if it is made

of shaped semi-circular stones laid side by side with the convex side uppermost. This procedure is, however, usually confined to boundary walls, or walls abutting on to a road. For purely ornamental walls, other procedures may be found more æsthetically satisfying One method is to take good, well-shaped flat stones about an inch wider than the width of the wall on each side, and lay

A drystone wall approaching collapse.

these on the top all along. If such stones are unprocurable, or the waller wishes to confine himself to the stone he can find for himself, he makes do with the flattest and widest stones he can find, and lays these on top. There will inevitably be gaps between them, and he fills in these gaps with good soil, in which he plants flowering rock-plants, such as wild thyme, aubrœtia, saxifrage, etc. These grow and spread, and give a charming, decorative effect to the wall, obscuring and concealing the gaps.

If neither of these practices is feasible, then wooden or metal boxes can be laid end to end along the wall, their sides covered in birch bark, and filled with soil to hold suitable plants. Most wallers would, however, regard such a finish as "cissy," and it is rarely seen in the genuine walling districts. Also the boxes soon decay.

The waller has to be careful not to strain himself. There is a correct and an incorrect way of lifting heavy stones. The correct way is to keep the knees close together, squat down, take a good hold, and rise with the knees still close together. He never keeps the legs wide apart and lifts stooping. This would throw a terrific strain on the abdominal wall.

Skill in walling comes only with practice. The skilled waller knows how to make use of a stone that seems to have no shape whatsoever. The knack lies in using small stones to prop it up, so that it will lie firm and flat enough to accept a stone above it without wobbling. In his impatience, the beginner will not test its stability on all sides, and will not notice that it has a wobble when the upper stone is laid on to it. In consequence, his first wall will, almost certainly, collapse, and he will know all the shame and disgust of an England cricketer out for a duck. His mates will comment sardonically on his failure. They will come up and with a few quick turns of the wrist, show him how he should go on. It looks dead easy, until he tries it . . . .

Also, his wall will seem to be an eternity in growing. But patience is the finest virtue in walling, and if he starts right, keeps right, and does not try short cuts, he will eventually a have a wall to be proud of, and if the experts find a few faults with it, that does not matter.

It is not uncommon for the maker of an ornamental wall to leave a few small gaps or pockets in the sides so that soil can be inserted and house leeks or other plants requiring little soil and moisture induced to grow out of it, which always gives a pleasing appearance.

Some stones are much more suitable for walling than others. Sandstone readily splits into nice flat pieces, and weathers quickly, which gives it an ancient look after a very short time. Also it is lighter than limestone or grit, but it decays more quickly. Millstone grit is quite good, but is rough and heavy, and in some districts not always easy to obtain in the right shape and size.

Pipeline Round the World

By John W. R. Taylor

ONE of the best-kept secrets of the last war was PLUTO, the Pipe Line Under The Ocean by which Allied armies were supplied with fuel from this country after the invasion of Normandy in June 1944. Less publicised, but no less remarkable, is the invisible pipeline round the world that Shell Aviation Service have built up since 1919 for the benefit of all who travel by air.

Its history is almost the history of commercial flying as a whole, which is logical enough as the primitive air liners of the 20s carried enough fuel for only a few hundred miles of flying, so that airlines could not possibly have expanded all over Europe, to Africa and the Far East had not supplies of fuel been available at landing grounds along the routes.

There was no question of providing elaborate refuelling facilities in the early days; most fuel dumps were arranged on a hand-to-mouth basis to supply the needs of a particular pioneering flight. Two or three men were usually sent to each landing ground, complete with a stock of two or four-gallon cans of petrol. After they had poured the fuel into the aeroplane—assuming the latter arrived—they packed up and went home again.

With the aid of such elementary but 100 per cent. reliable service, the whole network of present-day air routes was pioneered by such great airmen as Sir Alan Cobham and Sir Charles Kingsford-Smith. In their wake came the airlines, most of which came to rely on Shell refuelling service along their international routes. Permanent bulk stocks were laid down at all main airports in 1928, and the first proper mobile fuel tenders were introduced soon afterwards. Then Imperial Airways decided to change over to flying boats, so Shell too became water-borne, and the magnificent "Empire" boats which developed our Empire air routes and made the first commercial flights across the Atlantic were serviced by modern efficient petrol launches.

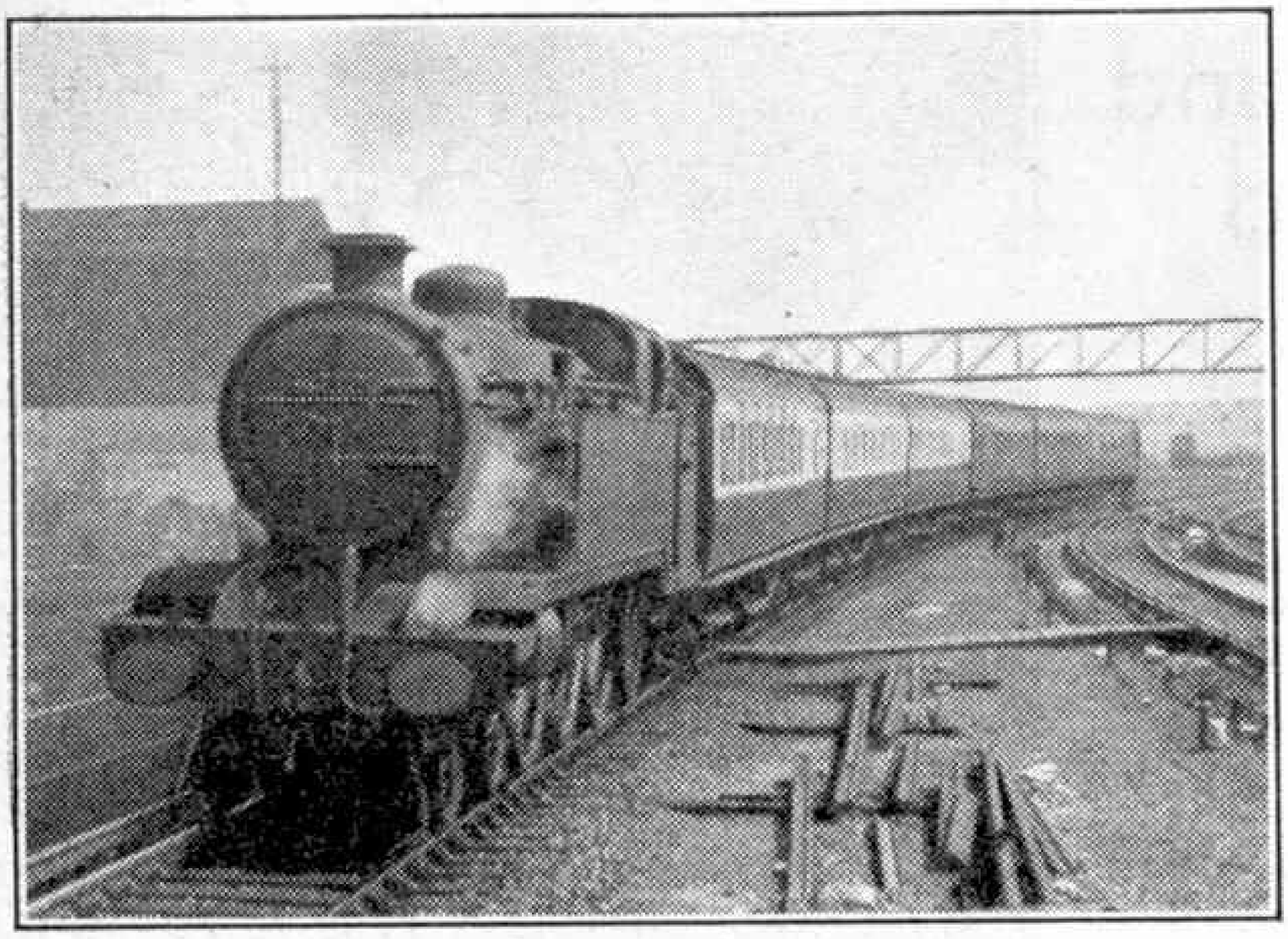
When war came, the whole Shell organisation was placed at the disposal of the Allies, and in two important war

The world's largest aircraft fueller "feeding" a Douglas DC-4 air liner at a Venezuelan airport. This new giant Thompson-Leyland mobile fueller has a capacity of 4,000 Imperial gallons and a maximum delivery rate of 400 gallons a minute. Photograph by courtesy of Shell Petroleum Co. Ltd.

zones Shell handled the fuelling of all aircraft except at forward operational airfields. When the Mediterranean was closed to our ships and aircraft, we were able to switch immediately to the reserve air route across Africa, which had been surveyed and stocked by Shell before the war, and this became the vital supply route for our Middle East Forces.

Since VE-Day, the reorganised Shell Aviation Service has paved the way for the greatest expansion of civil airways in history by providing fuel at no fewer than 1,100 airfields in 100 different countries and territories outside the North American continent. The sudden emergency of the Berlin Air Lift found the company fully prepared to provide extra fuel and service, to the extent of over 14 million gallons of petroleum supplies at the Berlin terminus of Gatow alone.

Now, at the beginning of the jet age, Shell plan to lay down stocks of jet-fuel as well as petrol along the Empire routes. Some idea of the quantity needed can be gained from the fact that over 71,000 gall. had to be available for the "Comet" during its two-month trial flight from England to the Middle East last year. An equivalent amount of petrol would take a small car round the world 114 times.



Southern 4-6-2T No. 32325, formerly L.B.S.C.R. "Abergavenny," passing Clapham Junction with a train partly composed of stock in B.R. colours. This engine was built in 1910 and, like the slightly different No. 32326, is the only member of its class. Photograph by G. R. Mortimer.

Railway Notes

By R. A. H. Weight

Famous Locomotives to be Preserved

We are very glad to hear from the Railway Executive that two further examples of widely differing historic locomotive types are to be preserved.

The first is No. 4003 "*Lode Star*," the oldest remaining engine of the famous Churchward 4-cyl. Great Western "Star" class. No. 4003 was built 1907 and is due for withdrawal this year. The pioneer engines of the standard "Star" series, Nos. 4001–2 "*Dog Star*" and "*Evening Star*," have already disappeared. Actually the forerunner of the long line of G.W.R. 4-cyl. express engines having high boiler pressure and long valve travel, which have influenced locomotive development in Britain to no small extent during the past 40 years, was "*North Star*," constructed at Swindon in 1906 as No. 40, with the 4–4–2 wheel arrangement.

No. 40 became a 4–6–0 in 1909, and was renumbered 4000 and superheated in 1913. It was rebuilt as a "Castle" in 1929, when its experimental variant of the Walschærts gear was changed to the standard mechanism as used on the other "Stars" and as seen to-day on their enlarged developments, the "Castles" and "Kings." There are two sets of gear only, between the frames, and from these the outside valves are actuated as well. Others of the "Star" class have been converted to "Castles," but a good many in almost original form still exist, though the end of their valuable careers may be soon in sight. The writer has stirring memories of excellent runs behind them in years gone by on the "*Cornish Riviera*," Paddington-Birmingham and other expresses.

The second historic engine is much smaller and older. It is No. 20002 in L.M.S. new numbering, and is a double-framed 6 ft. 3 in. 2–4–0 built 85 years ago at Derby Works. This veteran is a remarkable example of the Kirtley era on the Midland Railway in Mid-Victorian times, and after running over 1½ million miles was withdrawn from traffic in 1947. Negotiations were then immediately begun with the L.M.S. authorities by the Stephenson Locomotive Society with a view to preservation, on account of the engine's importance from the historic point of view. Though no definite decision was reached at the time, scrapping was prevented, and No. 20002 went into store. In course of time it has acquired a newer Johnson boiler and some Deeley fittings, but the characteristic appearance of the period is still in evidence, as will be seen from the photograph we hope to publish shortly.

For the time being the two engines will remain respectively at Swindon and Derby Works. "*Lode Star*" will be renovated and repainted in original style.

Some Freight Operating Facts and Figures

About 60 per cent. of the freight tonnage carried by British Railways consists of coal or similar fuel, which provides 39 per cent. of the cash receipts. Some 160 million tons are conveyed in a year. As thousands of wagons are required daily for loading at the collieries, area or control offices compile daily returns based on telephone messages from the pits, stations and marshalling yards. The number of wagons on hand in the colliery sidings is known at noon each day, when the recordings include also the number despatched since the previous day and the number required for loading, with reports as to the position at depots along the running lines.

There are 3,000 B.R. special wagons of varying size for carrying exceptional loads weighing from 15 up to 150 tons, such as trees, girders, ships' propellers and electric transformers. Records of the storage place or journeys in process by such vehicles are centrally maintained by means of a card index system.

Southern Locomotives Allocated in Groups

Considerable progress has been made as a result of recent reallocations in the commendable system of grouping engines of the same class in batches with consecutive numbers at one shed. So long as it does not involve too many transfers this practice may be developed. It already extends to most of the modern and powerful types.

For example, "Merchant Navy," 4–6–2s Nos. 35011–20 are at Nine Elms. There are long runs of light "Pacifics" at Exmouth Junction and its Devon sub-sheds, and shorter ones at Nine Elms, Stewarts Lane, Ramsgate and Bournemouth, with five at Brighton and four at Dover. There are eight "Nelsons" at Eastleigh and five at Bournemouth. Among the "King Arthurs" we find a group of 10 stationed at Dover, 11 consecutive ones at Eastleigh and six at Ashford. All the "N15x" class are at Basingstoke and all class "D15," the largest 2-cyl. 4–4–0s, at Eastleigh. All "N1" 3-cyl. 5 ft. 6 in. 2–6–0s are at Hither Green and all remaining "Atlantics" at Newhaven or Brighton.

The "Schools" are divided into four groups at St. Leonards, Ramsgate, Dover and Bricklayers' Arms respectively. The "L1" 4–4–0s are at Dover or Bricklayers' Arms, and the "L" class at Tonbridge, St. Leonards, Ashford and Ramsgate. A long run of "S15" 4–6–0 goods is at Feltham and smaller groups of "W" 2–6–4Ts at Norwood and Hither Green. The "U1" 3-cyl. 6 ft. "Moguls" are divided in batches between Brighton, Redhill, Bricklayers' Arms and Stewarts Lane, while the Bulleid "Q1" 0–6–0s are shedded mainly at Guildford, Feltham, Eastleigh and Tonbridge.

The same system of consecutively numbered groups

has been applied to the L.M.R. type 2-6-4T engines built at Brighton, including the latest in traffic at the time of writing. These are now allocated as follows: Nos. 42096–42106, 75F, Tunbridge Wells; 42066–70, 74B, Ramsgate; 42071–4, 74A, Ashford; 42075–9, 74C, Dover; 42080–4, 73A, Stewarts Lane, London; and 42085–7, 75A, Brighton.

Slot Meter Left Luggage Offices at Stations

Last year 40 lockers for passengers' use were installed experimentally at Euston Station, London, as mentioned at the time in these notes. The idea having proved popular, "sixpence - in - the - slot" luggage lockers are to be fitted up at a number of busy stations in London and provincial cities or towns, including some on the coast, from Eastbourne to Newcastle and from Cardiff to Ipswich.

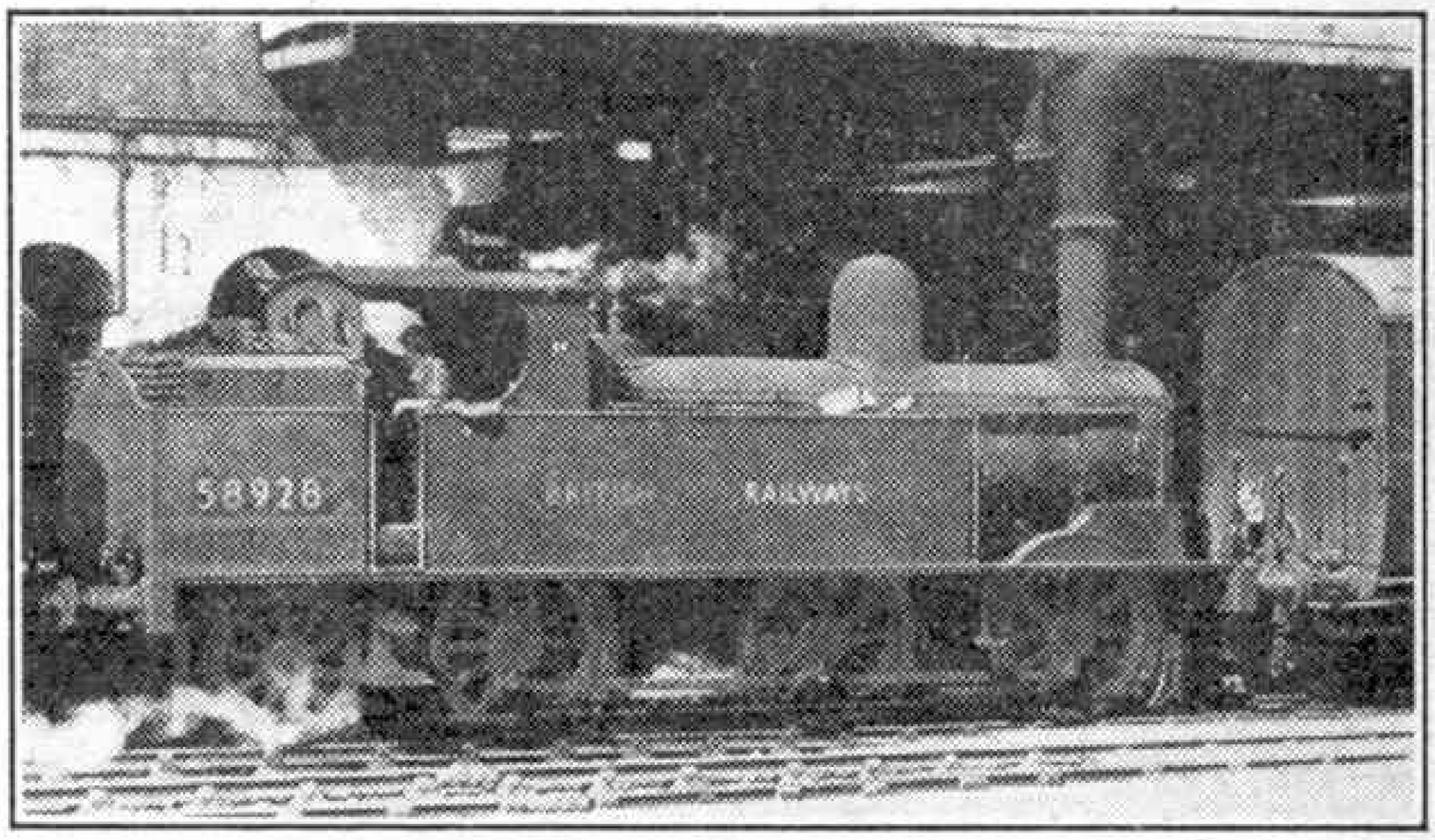
Steel lockers 18 in. high and 16¾ in. wide will be fixed in units of eight. By placing sixpence in the slot a passenger obtains the key to a private locker, in which he may deposit property and withdraw it at any time within 24 hrs. After that period the luggage is removed to the Cloak Room where the owner can claim it on producing the numbered key, so leaving the locker ready for the next depositor, the lock having been changed in the meantime.

Eastern and North Eastern Regional News

The new "7" standard 4–6–2, No. 70001, was named "*Lord Hurcomb*" at Liverpool Street on 6th March. Since then Nos. 70002–5 have been completed for service on the Eastern Region up to the time of writing. No. 70004 "*William Shakespeare*," being specially embellished, has been diverted for the time being to Charing Cross Railway Bridge as one of the exhibition locomotives in connection with the Festival of Britain.

"K1" 2-cyl. 2–6–0s have been noted hauling semi-fast passenger trains from Cambridge to both Liverpool Street and King's Cross being stationed at March. New engines placed in service recently include "B1" 4–6–0s Nos. 61374–5, stationed at 40B, Immingham; class "4" 2–6–0s Nos. 43097–9, 50C, Selby; and "EM1" 0–4–4–0 electric Nos. 26004–7, 39A, Gorton. No. 26020 also has been completed for exhibition in London; the wheel arrangement of these electric locomotives is 0–4–4–0, not 0–6–6–0 as notified officially and published in our April issue.

The following "A1" engines have been seen named: No. 60150 "*Willbrook*," No. 60151 "*Midlothian*," No. 60153 "*Flamboyant*," No. 60155 "*Borderer*," and No. 60158 "*Aberdonian*." "*Midlothian*" has the improved cast chimney. We have not yet heard of the "company" name-plates with coats-of-arms "*North Eastern*," "*Great Central*," "*Great Eastern*," and "*North British*" being affixed to Nos. 60147, 60156–7 and 60161 respectively. Otherwise most of these "Pacifics" are now named and painted blue.



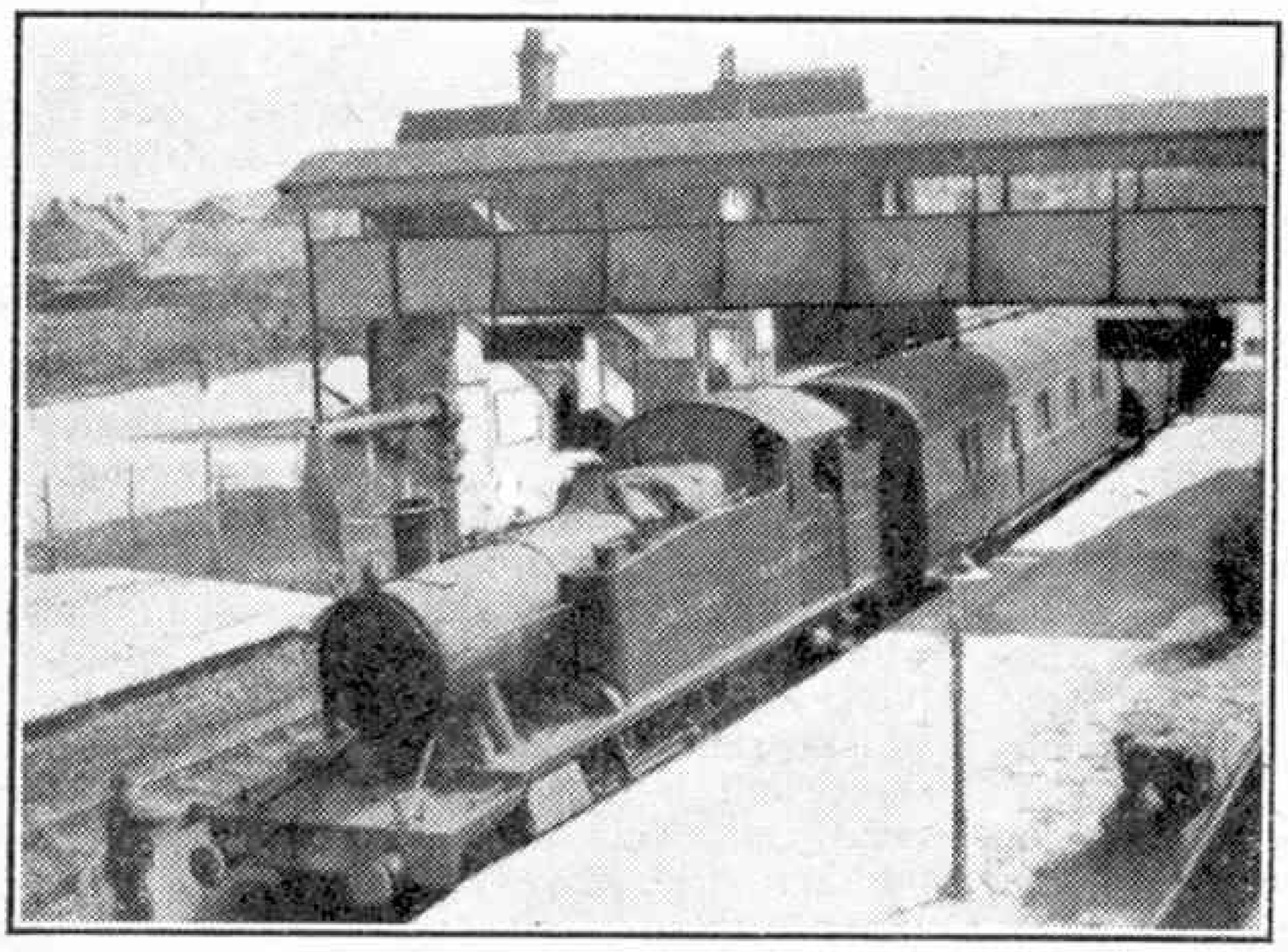
A Webb "coal tank" of the former L.N.W.R., now B.R. No. 58928, on station pilot duty at New Street, Birmingham. Photograph by H. Weston.

Southern Tidings

After naming ceremonies at Southampton Docks, completing the naming of all 30 engines of the class, "Merchant Navy" 4–6–2s, Nos. 35026 and 35028–9 named "*Lamport and Holt Line*" "*Clan Line*," and "*Ellerman Lines*" respectively, were expected to return to the Eastern Section. The last Stirling "B1" 4–4–0, No. 1443, has been broken up at Ashford, where a good many S.E. and C. 4–4–0s are being scrapped, including the superheated "E" class, also rebuilt "D1" and "E1" engines.

Inroads are being made into the larger Drummond L. and S.W. 4–4–0 classes, together with further withdrawals of "13" 4–4–2Ts and other former L.B.S.C. engines. A long-distance train of fairly fast character still often operated by "13" one-time express tanks is the Sunday 4.50 a.m. news and passenger train from London Bridge to Eastbourne, traversing the usual main line electric route.

A heavy Pullman special from Victoria to Eastbourne for the recent Dollar Convention was headed by electric locomotive No. 20001, the first of the type to be put into service. This locomotive has two six-wheeled bogies; this arrangement being indicated by Co+Co.



W.R. local train to Yatton at Wells. The engine is one of the small G.W.R. 2-6-2 tanks, No. 5514. Photograph by T. Sprague.

Australia's Beach Life Savers

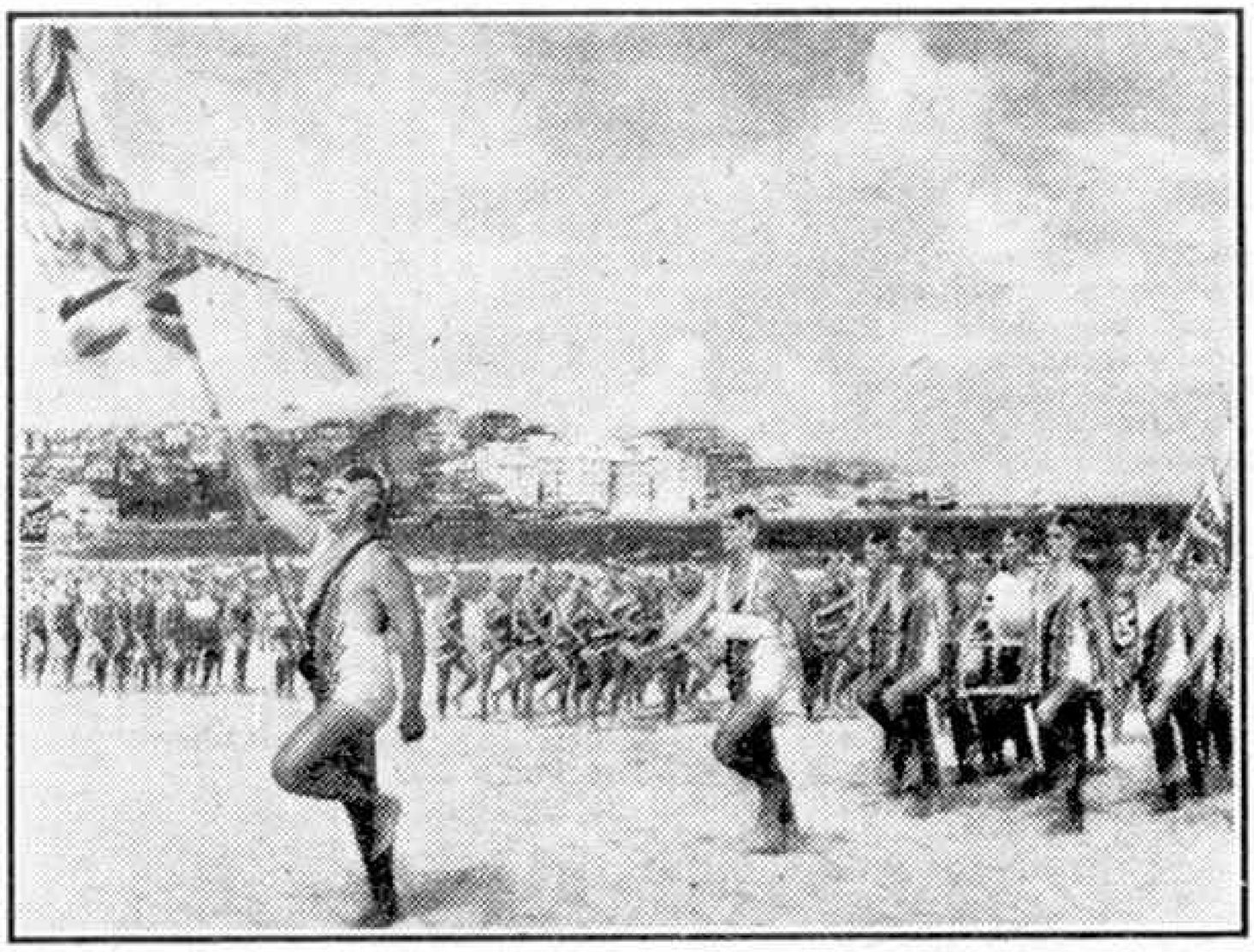
Story by Ian Hamilton
Photographs by J. Fitzpatrick

A PLAYFUL kitten had a small but key role in developing a technique that has saved the lives of many thousands of Australian swimmers.

In the early 1900s an ardent Sydney surfer drowsily watched a young kitten frolic with a reel of cotton. Suddenly he sat upright. The kitten's antics had given him an idea.

A few days before, the surfer, an Army sergeant named Bond, had seen a strong swimmer reach a drowning man in a heavy sea, but then be forced to let the struggling man go and fight for his own life. The surfer reasoned that if the rescuer had carried from the shore a line that could have been wound back on a reel, both he and the drowning man could have been dragged to safety.

Experiments proved Bond's idea was sound. So since 1908 gear reels have been standardised equipment on all popular surf beaches patrolled by members of the Surf Life Saving Association of Australia, a spectacular and highly organised force of beach guards who give up their spare time to saving people's lives.



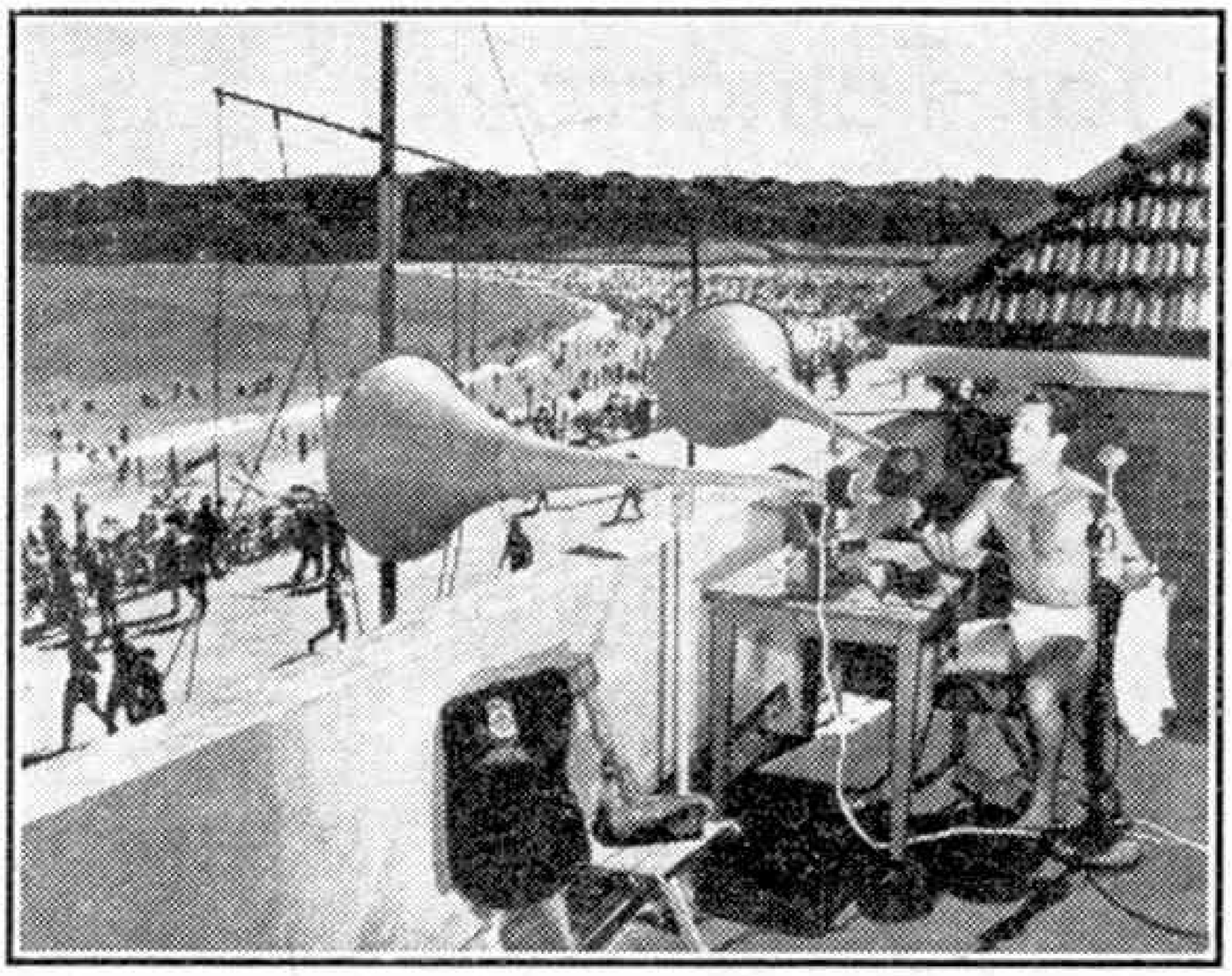
Surf club life saving teams, with standard bearers and beltmen in front, in the march-past championship contest on Bondi Beach, Sydney.

This voluntary organisation handles an immense task, for it is responsible for patrolling all the fine sandy beaches at the surf resorts along the continent's 12,210 miles of coastline. The Association controls about 175 affiliated clubs with approximately 8,000 active members, who come from all walks of life. An additional 6,000 active-reserve or associate members, who are too old or unable for other reasons to carry out active duties, help to handle routine club administration. The bulk of the organisation's active membership of 5,000 is in New South Wales.

Since the Association was formed in 1907, it has dragged more than 73,000 weak, unwary or foolhardy swimmers from the surf. The average number of lives saved during each of the post-war swimming seasons has been nearly 4,000. This year the figure is expected to be higher because many newcomers to Australia from the United Kingdom and Europe are not surf safety conscious. Normally Australian surf beaches are neither dangerous nor difficult. But sometimes an undertow or a dangerous cross-current, particularly when sand banks are moved by storms or severe gales, tends to sweep swimmers out to sea. Or seaweed may foul life lines during the rescue.

The morale of the lifesaver must be high and he must be in first rate physical shape to meet the demands on him. Before a recruit is even admitted to a lifesaving club he must swim a quarter of a mile in open sea in less than eight minutes. Then he must spend weeks of training to qualify for the Surf Life Saving Association's bronze medallion, which calls for a knowledge of simple physiology, resuscitation, the flag and whistle signals used between patient and shore and between surf boats, and surf team drill. This drill, modelled on British military drill, gives the lifesaver polish and precision.

He must also be able to take his place in any of the positions in the usual



An elaborate loudspeaker system, with volume sufficient to be heard above the roar of the Bondi Beach surf, helps to keep the toll of the sea down almost to zero. It is used to direct surfers into safe zones and to control surf boat movements.

six-man rescue team. He starts as a rule as a "patient" in practice drills. Then in turn he learns the job of beltman, who swims out to the person in difficulties with a line; resuscitator, who is responsible for expelling from the lungs the water a swimmer has swallowed; either of the two linesmen's position—their responsibility is to see that the line is played out or drawn in smoothly; or the reelman, who plays out or draws in the line carried by the beltman.

The reel, with metal bearings, is mounted on an arched wood stand—metal corrodes too easily—about 2 ft. high. It carries about 440 yards of Egyptian cotton line as thick as a cigarette, with a breaking strain of 600 lb. The two types of lightweight belts now in use—the Ross safety belt designed in New Zealand and the belt designed by Keith Maynyard, of North Bondi club, Sydney—are worn low on the chest and are adapted for quick release if the line fouls. Two lifesavers lost their lives when this happened in the 1949-50 season. Resuscitation is often performed manually, but some clubs have "Eve" rockers, a rocking device developed by Dr. Eve, of the United Kingdom.

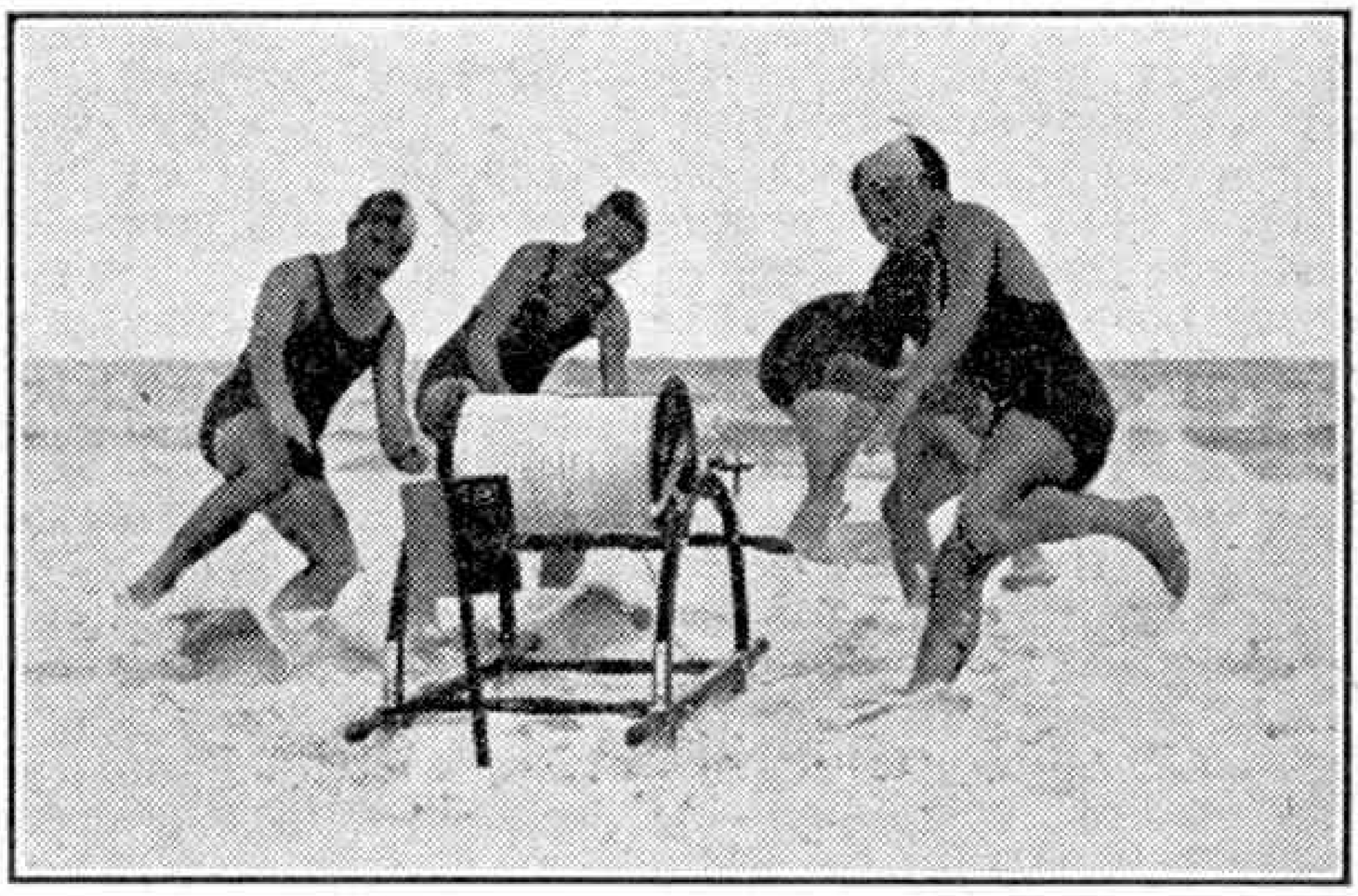
Having passed all these tests, the lifesaver becomes a member of one of his club's rescue squads. This entails compulsory regular patrols solely for honour and glory at weekends and on public holidays.

State Governments subsidise clubs, and this year the Federal Government has set aside £A10,000 to be divided between the Royal Life Saving Society, which controls patrols at many still water beaches, and the Surf Life Saving Association. But club members raise most of the money they require from subscriptions and through dances and other social functions.

The demand for ready cash grows, as costs of equipment have risen considerably since the war. A reel, which before the war was £A12/10/–, costs up to £A25 to-day. A surf boat, pre-war £A120, is now £A350; and a life line, £A3/5/– in 1939, is £A8 to-day.

In the Sydney area alone, on any hot summer Saturday or Sunday about 300,000 flock to the metropolitan surf beaches. "Going to the beach" is an Australian habit of more than 40 years' standing and a comparatively cheap and *safe* way to spend a day, because these volunteer guards have practically eliminated drowning.

We are indebted to the Australian News and Information Bureau for this article and the accompanying illustrations.

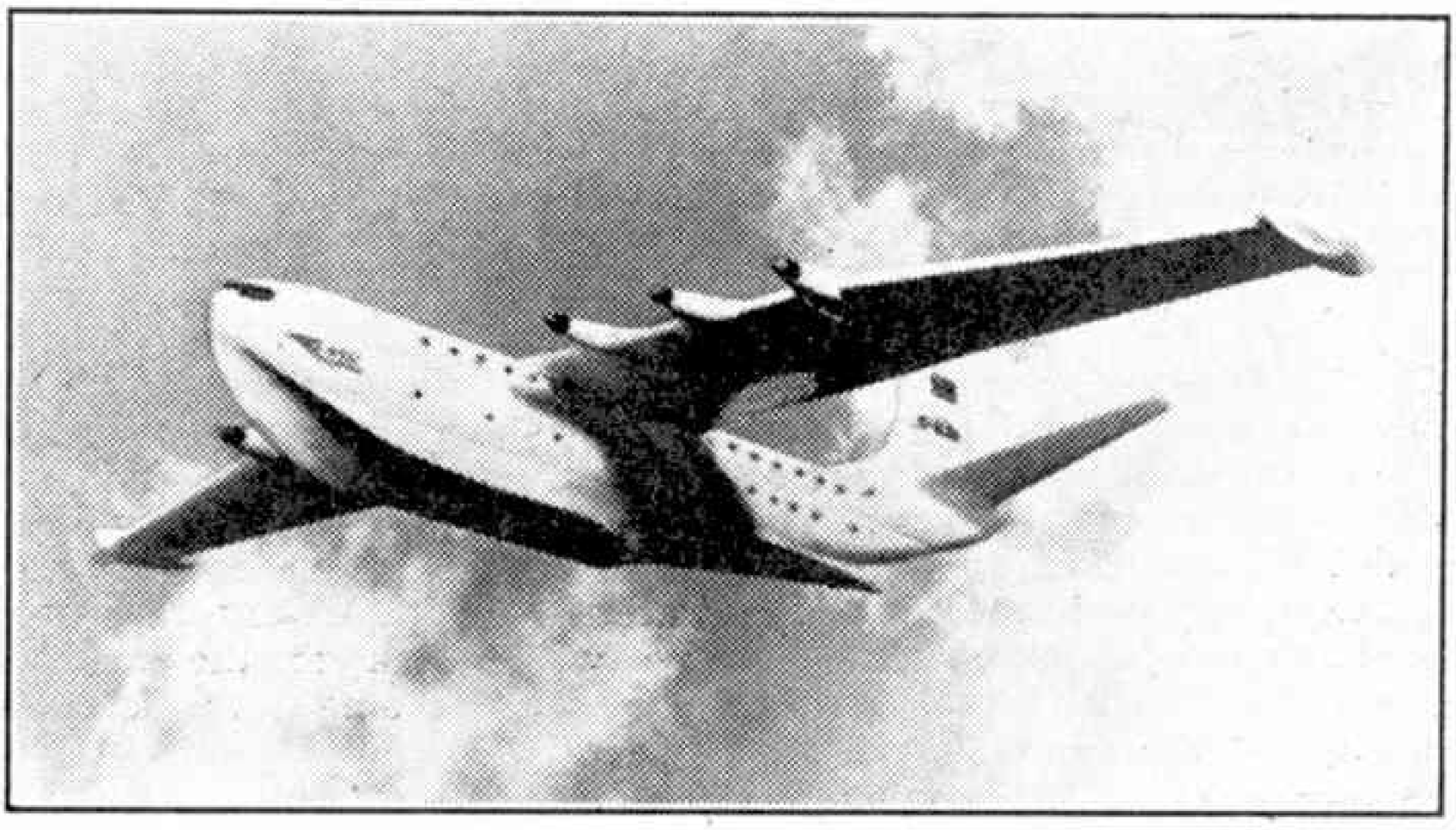


Sand flies as a club team crew in the belt race rushes to carry its life-saving reel nearer to the surf. The beltman, seen in the background bending to pick up the belt, swims out to a marker buoy and back.

Wings for Tomorrow

TO-DAY flying boats are out of favour with those who decide the equipment of our nationalised airlines. British Overseas Airways Corporation have gone over entirely to landplanes, and the only company now operating a scheduled flying boat service from Britain is Aquila Airways. On the military side, R.A.F. Coastal Command have had to turn increasingly to landplanes in the absence of any new flying boats to replace their ancient and well-used "Sunderlands."

There are many people, however, who believe that eventually the flying boat will come into its own again. In the meantime it is important that the all-out preference for landplanes developed by B.O.A.C. and the Ministry of Civil Aviation should not lead the public to think that this kind of aircraft alone has all the virtues. That is very far from the truth, and the recently-published book *"Wings for Tomorrow"** performs a valuable service by reminding one of the fine work done by flying boats, and of the important advantages of these aircraft.



An artist's impression of the 140-ton "Princess" flying boat in the air. This illustration is from the book "Wings for Tomorrow" reviewed on this page. Photograph by courtesy of Saunders-Roe Ltd.

The aim of this book is to keep the subject alive by stimulating discussion and ensuring "that people talk about flying boats even if they cannot fly in them." It should be very successful in this, as in addition to giving a comprehensive account of the development of the flying boat, the authors set out their reasons for believing that this type of aircraft is ideal for both transocean air services and long-distance military operations.

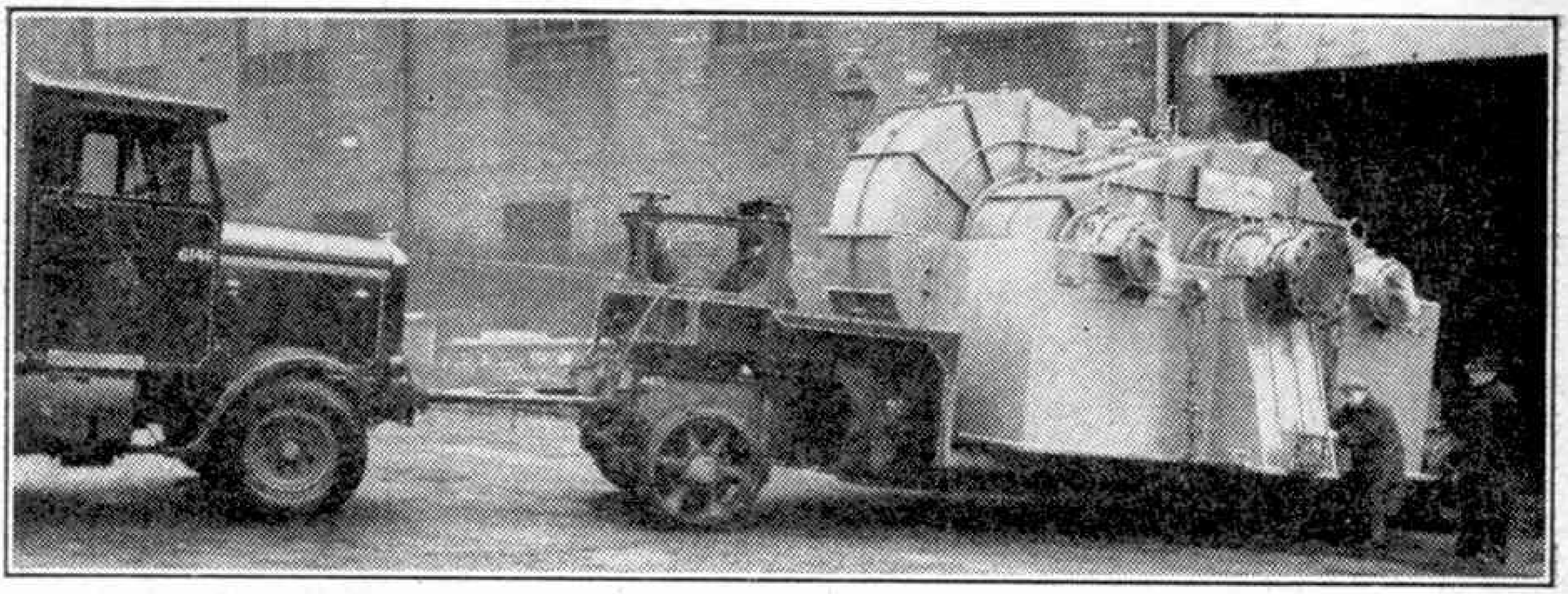
The greater part of the book is devoted to a detailed history of the flying boat, from the earliest conception of the flying machine able to take-off from, or land, on water, to the giant Saunders-Roe "Princess" flying boats now under construction.

The many outstanding achievements of flying boats in peace and war are an integral part of the history of this type of aircraft. *"Wings for Tomorrow"* abounds in thrilling stories of their exploits, first during the latter part of the 1914–18 war, then during the 20 years or so before the second world war, and finally during that conflict. It is interesting to learn that during the first world war "Britain was the first country in the world to realise the possibilities of large flying-boats for marine reconnaissance and anti-submarine duties."

The years between the wars were notable for the world-wide development of commercial airlines. The vast Empire air routes inaugurated by Imperial Airways, and continued by their successors, B.O.A.C., were operated with a large fleet of Short "Empire" flying boats, the great success of which showed them to be ideal for transocean airlines. Between them the "Empires" covered well over 40,000,000 miles. Similarly, a series of remarkable long-distance flights by R.A.F. flying boat squadrons demonstrated that the military counterparts of the civil flying boats were second to none in the world.

In the second world war the "Sunderland" flying boats of R.A.F. Coastal Command made glorious history by the great part they (Continued on page 286)

* *"Wings for Tomorrow" by John W. R. Taylor and Maurice F. Allward. Ian Allan Ltd. Price 7/6.*



Engineering Notes

A 52-ton Gear-Box

The gear-box shown in the illustration on this page, which weighs 52 tons, has been constructed by David Brown and Sons (Huddersfield) Ltd. for installation in the Norwegian tanker *"Bernhard Hanssen."* This vessel is under construction by William Gray and Company at West Hartlepool.

In our illustration the gear-box is seen being towed out of the works at Huddersfield for transport by road to the shipbuilding yard. It is designed to transmit continuously the combined power from two six-cylinder Polar diesel engines, each developing 2,360 h.p. at 250 r.p.m., through a single propeller shaft. It is of the horizontal type, with a single helical pinion disposed at 9 ft. 6 in. centres on each side of the main wheel. A Vulcan hydraulic coupling is incorporated on each engine output shaft, and the power available at the gear unit main shaft coupling is 4,300 h.p. at 110 r.p.m.

A large gear-box, weighing 52 tons, leaving the works of its makers, in readiness for transport by road to West Hartlepool, to be installed in the Norwegian tanker "Bernhard Hanssen." Photograph by courtesy of David Brown and Sons (Huddersfield) Ltd.

New Scottish Hydro-Electric Power Scheme

The provision of hydro-electric power in the far north of Scotland will be carried a stage further by the new Loch Shin project, details of which have been given by the North of Scotland Hydro-Electric Board. Loch Shin is in Sutherland, and its waters are carried by the River Shin to the Kyle of Sutherland, which opens into Dornoch Firth. Altogether six power stations are to be built, and these will make use of the water of Loch Shin itself and the streams flowing into it, and also of other rivers in the district. When the work is complete the water power resources of an area of 250 square miles will be harnessed. The power stations will have a combined installed capacity of 44,000 kW, and the cost of the scheme will be about £8,000,000.

A dam 39 ft. high and 1,125 ft. long will be built at Lairg, where the River Shin leaves the Loch. This will increase the storage capacity of the Loch to 10,300 million cu. ft. In order to allow salmon to continue to ascend the stream a salmon ladder will be provided.

Water from the Loch will be carried through a tunnel five miles in length to the main power station of the scheme, which will be built on the northern shore of the Kyle of Sutherland. The capacity of this station will be 25,000 kW. Of the remaining five subsidiary power stations three will be built on the shores of the Loch. Two of them will draw water from tributaries, and the water required for the third will be brought by tunnel from the upper waters of the neighbouring Cassley River. The two further stations will make use of the waters of lochs and streams higher up than Loch Shin, and in each case storage capacity will be increased by the building of dams.

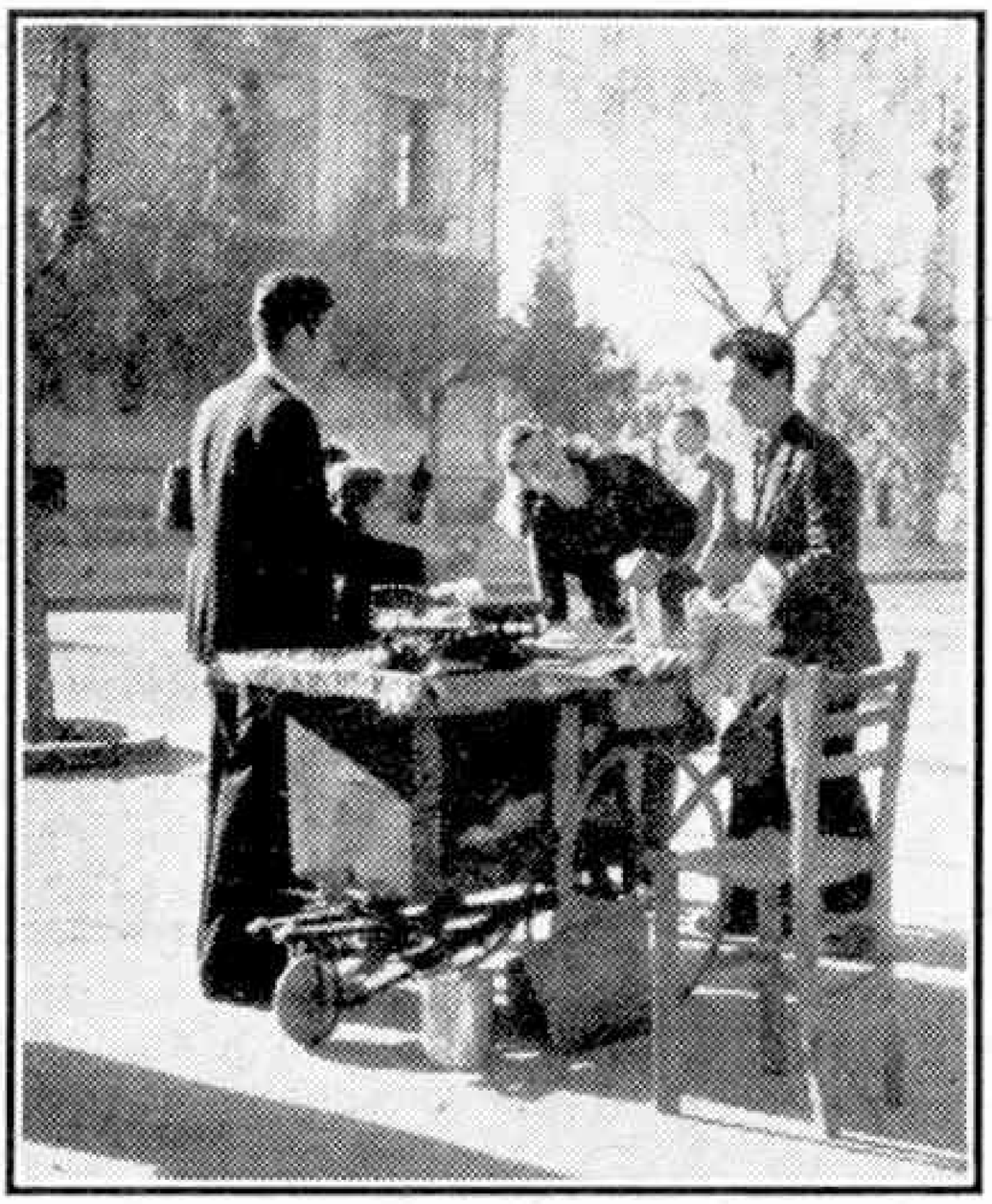
A further project is the construction of a new diesel generating station in Wick. In this 600 kW diesel generating sets will be installed, giving a total installed capacity of 3,600 kW.

Exploring Athens

By E. Emrys Jones

GREECE often comes into the news, and when it does Athens, the capital, is invariably mentioned. What would you expect to find in that city? In the first place, let me assure you that you would realise that it is most beautiful and interesting, so why not come with me and have a walk round it?

What do the people look like? Are they tall and dark, or fair or short? The group around the nut-stall will give you a good clue. Generally, they are dark-haired, of medium build, pleasant and dressed just as we are. The nut-stall? Oh yes, you will find hundreds of these in Athens. Roasted nuts are preferred. The salesman sits by his stall and shells the almonds and walnuts. The shells are placed on the fire, which burns inside his stall, or mobile oven if you prefer that description, and a marvellous aroma comes from the chimney smoke, because once the fire is lit, the fuel from then onwards is just the shells of the nuts. A small bag of roasted nuts will cost you from sixpence to a shilling.



A characteristic street scene in Athens, with eager buyers round a stall where walnuts and almonds are roasted.

Let us move along and see what else is for sale. Again, there are pavement vendors, selling sugar, tea, coffee, spices, camphor, trinkets, fruit, clothing and even large lumps of rubber! Leather soled shoes are expensive in Athens, and so is repair work, but the thrifty can buy pieces of rubber cut to shape from old tyres, a pot of glue and a leaflet on "How to glue a rubber sole on your shoe."

In the main streets, such as Churchill Street, you will be amazed at the really splendid shops full of luxury goods. The modern restaurants and cafes in the "West End" of the city also are very well equipped and furnished. The shopkeepers all speak excellent English, as well as French, German and, of course, Greek.

These four languages are taught in the secondary schools, so that an 18-year-old boy could converse with you in perfect English. The Greeks are expert linguists and have the knack of "picking up" a language easily. A photographic dealer whom I knew in Athens came from Armenia. Besides speaking Armenian and Greek his English, French and German were perfect, and he could carry on a technical discussion on photography in any of these languages. He also had a good working knowledge of Italian and Turkish!

Most of Athen's street sweepers are women, and you will see them doing a real man's job, sweeping all the paper into a cul-de-sac and then sorting it all out! Why, did you ask? Well, paper money is used in Greece and it is easily lost! Notes of the value of 1,000 drachmæ are the usual ones and as there are over 40,000 drachmæ to the £1 these are worth only 6d. each. Often one's pockets get full of notes, and yet the value may only be about 10/– in all. There are also 10 and 100 drachmæ notes floating around, but these are practically valueless these days.

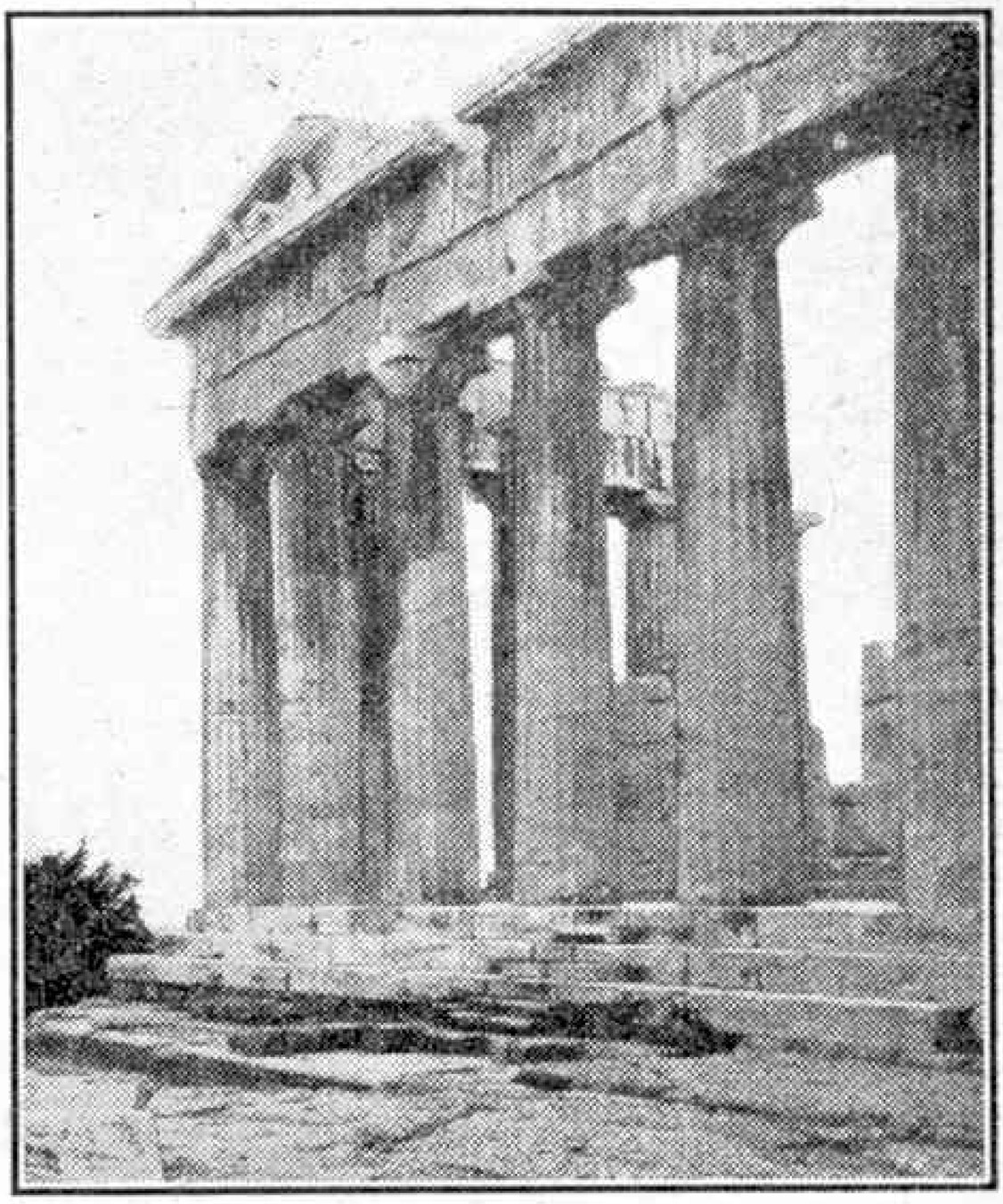
Let us leave the streets and climb to the Acropolis, the citadel of ancient Athens. There are several buildings on the summit of this hill. The most important is the Parthenon. This temple is enclosed by a colonnade on all four sides, with eight columns at each end and seven along each of the long sides.

The proportions of this building were worked out with remarkable delicacy and mathematical precision. Absolutely

straight lines are avoided throughout. All the columns lean slightly inwards, and the shafts not only taper upwards, but also have a slightly convex silhouette. The floor rises towards the centre or middle of the temple, an effect that can be detected by looking along the line of the steps. This almost imperceptible curvature of the lines was mainly designed to correct optical illusions that would make the structure look weak.

Soon after 430 A.D. the Parthenon was converted for use as a Christian Church. When the Turks conquered Athens the temple became a mosque and a minaret was added. Things were then fairly quiet until the great explosion of 1687. At that time Count Morosini, a Venetian nobleman and warrior, was besieging the Acropolis. Learning that the Turkish garrison kept its store of powder in the Parthenon, he opened fire with his artillery and exploded the magazine. Since then the venerable building has been a ruin.

Other famous buildings are the Erechtheum, the temple of Erechteus, a national hero of ancient Athens, and the Athena Niké temple. Niké means Victory, and it was as the bringer of Victory that the goddess Athene was worshipped on this spot.



Pillars of the Parthenon, the ancient temple, now in ruins, that crowns the Acropolis, the famous rocky height around which Athens clusters.

From the summit of the hill of the Acropolis you will have a fine bird's eye view of the city, flanked by bare brown mountains. One place in particular that will take your eye is the Temple of Olympian Zeus, just to the right of the Zappion Gardens, the Hyde Park of Athens. Let us descend the hill and make our way down to the main road and to the grounds of the temple. It was once one of the largest temples in the world. The walk round the outside of it was 730 yards, or getting on for half a mile, in length. It took the best part of 700 years to build, for it was begun by Peisistratos, an ancient Greek dictator, and completed by the Roman Emperor Hadrian.

Two complete rows of marble columns ran all round this temple, 104 in all. In the Middle Ages a hermit built himself a cabin on top of one of the columns, and lived there for years, having his food sent up to him in a basket!

Let us cross over and make our way to the north side of the Acropolis, because I want to show you the "Big Ben" of ancient Athens, which was also one of the first weather forecasting stations in the world! This is a small tower known as the Tower of the Winds,

The Tower of the Winds, the timekeeper and weather forecasting station of ancient Athens. Sundials gave the time, and reliefs on the outside of the Tower depicted winds from eight directions and indicated the kind of weather they brought.

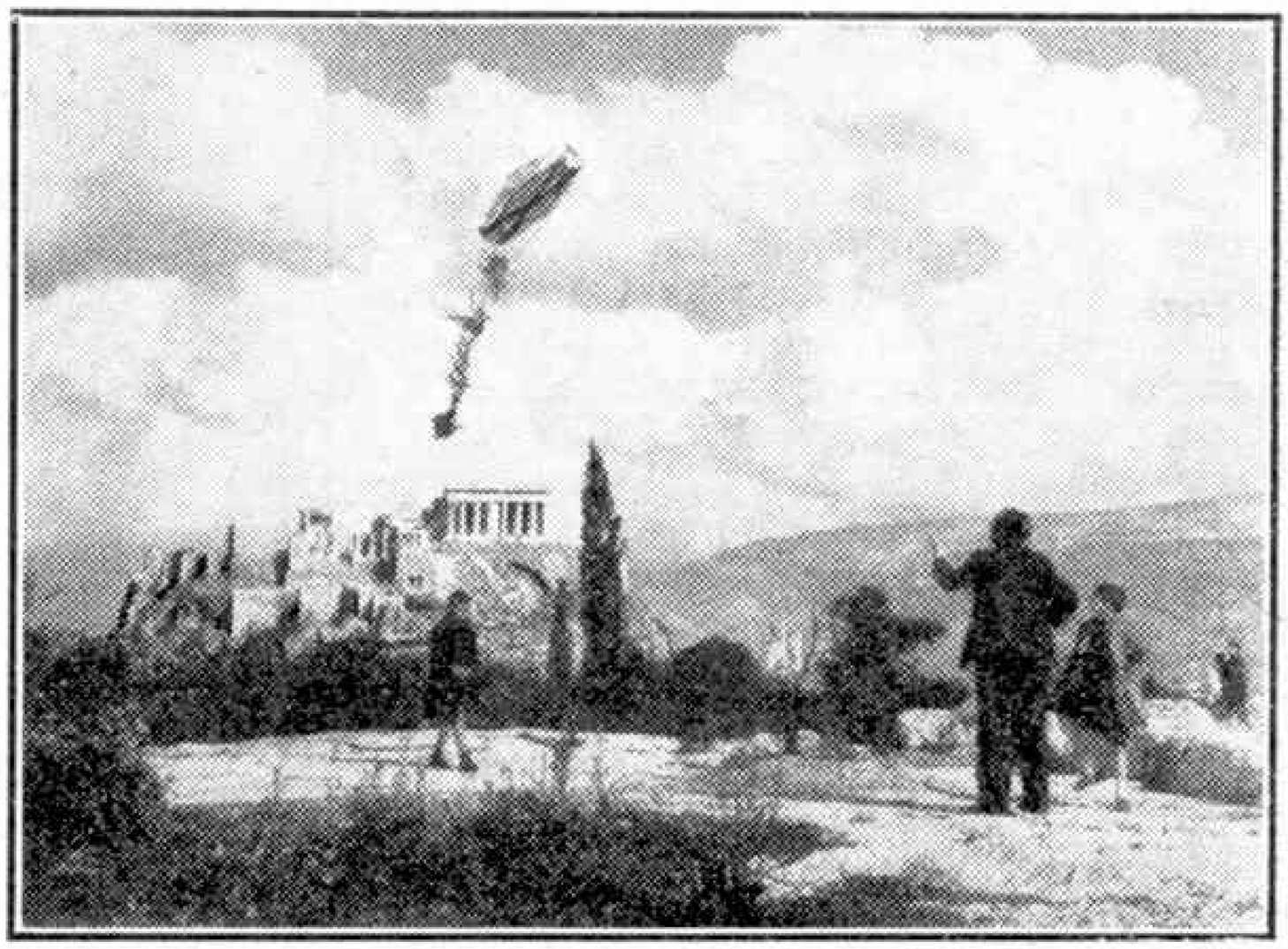
where the time was told by means of a water clock, which was worked by a small aqueduct at the bank, and also by multiple sundials, which are to be seen even to-day on the outside of the tower. The sundials still work!

The Tower of the Winds was built about 40 B.C. On its roof was a weather vane, in the form of a cock that indicated the direction of the wind, and outside it reliefs depicting the eight winds in human form. For example, the north-westerly relief shows a figure holding a vase to catch the rain, an indication to the ancient Greeks that when the north-west wind blew there was a risk of showers. The remaining seven had similar signs to show and they too are sound in their observation of weather conditions.

Talking of weather reminds me that the Athens area too gets its March winds. These strong winds blow for about a week, and this is the time for the male population of Athens to trudge up the Pnyx Hill and fly their kites. Young men, schoolboys, and grand-dads all love kiteflying. Mars Hill, or the Areopagus as the Greeks call it, is another favourite spot for this windy-day sport. St. Paul preached to the Athenians from this hill. Another conspicuous hill is that of Likavittos, on the summit of which is the tiny little church of St. George.

Well, we have seen a great deal of Athens, and I think we will go for a meal. What about a nice plate of fried octopus and chips? This is a great favourite of the Greeks. The squids, or small octopuses, are caught in the Bay of Phaleron, near Athens, and are really delicious when fried in olive oil, and served with brown, nutty flavoured chips!

The squids, by the way, are caught by spearing. The fisherman goes out on the clear blue water of Phaleron Bay in a fairly low rowing boat, lying stretched out and "on his tummy," as they say. Using his left hand as a paddle, he gently propels the boat. A spear is poised at the ready in his right hand. His chest lies over the front part of the boat, so that his head is free to gaze into the water. Floating in front of the fisherman is a box with a glass bottom. He places his head right in this and thereby scans the sea bed for squids. The water must be dead calm for this work. Silently, slowly, he glides through the water peering into the glass all the time. Suddenly a squid is spotted, and the spear is thrust, with a lightning stroke. The aim is deadly accurate, and another squid has become victim to a stealthy and patient marksman.



Kite flying in March, a favourite pursuit of many Athenians. In the background is the Acropolis, with the ruins of the Parthenon and other classic buildings on it.

Nothing pleases a Greek family more than to dine in an open air cafe, especially so on a Sunday evening in summer. The food is brought on one big plate, one course at a time, and this plate is placed in the centre of the table. Each person is supplied with a small fork, and on a nod from the head of the family, or host, as the case may be, eating commences.

I may now have whetted your appetities in more senses than one. Seriously, this fine city, the capital of Greece, is really worth exploring. There is nothing dry about its ancient monuments. What beats me is their fine workmanship throughout, and the fact that they have survived centuries of turmoil and weather. They are still a challenge to our modern buildings. The Greeks certainly love their Ancient Athens and its carefully guarded treasures. As one might expect, you will find a well organised sight-seeing service for foreign tourists and the guides speak perfect English. When your opportunity comes of visiting Athens, make a point of exploring these places right away.

Chinese Trains were Different

By Bernard Llewellyn

SOMETIMES, when I fail to secure a seat in the train at London Bridge and have to stand with a number of others in a draughty corridor, or jammed between the knees of the seated passengers in a compartment, my mind goes back to the first train journey I ever made in China. And no sooner have I recalled it than I begin to be thankful for having a corridor or a compartment to stand in, and only twenty minutes of standing at that!

In July 1942 I was in Kunming, South West China's largest city, which was linked by railway with Hanoi and Haiphong in Indo-China, and with the little walled city of Kutsing a hundred miles to the east. One day I got orders to proceed to Kutsing, and since there was no road transport available there was nothing for it but the train.

A Chinese train stops in a wayside country station, and some of the passengers take a stroll along the platform.

So at six o'clock one morning I climbed into a ricksha with my luggage on top of me and started for the station. We had got about half way when my ricksha coolie cut sharply in front of another ricksha in a narrow alley. The wheels interlocked, and at once the two coolies set down the shafts and, uttering loud oaths, began to set about one another. A crowd gathered before I could emerge from beneath the luggage and separate them.

Eventually we got started again; but the delay had not helped. The station was jammed with people, and the train likewise, and by the time I had got my ticket there seemed to be no possible place on the train for another passenger. There were people spilling out of the coaches; some sat on the roofs of the coaches, and others were perched on the coal behind the engine. A couple sat astride the buffers in front.

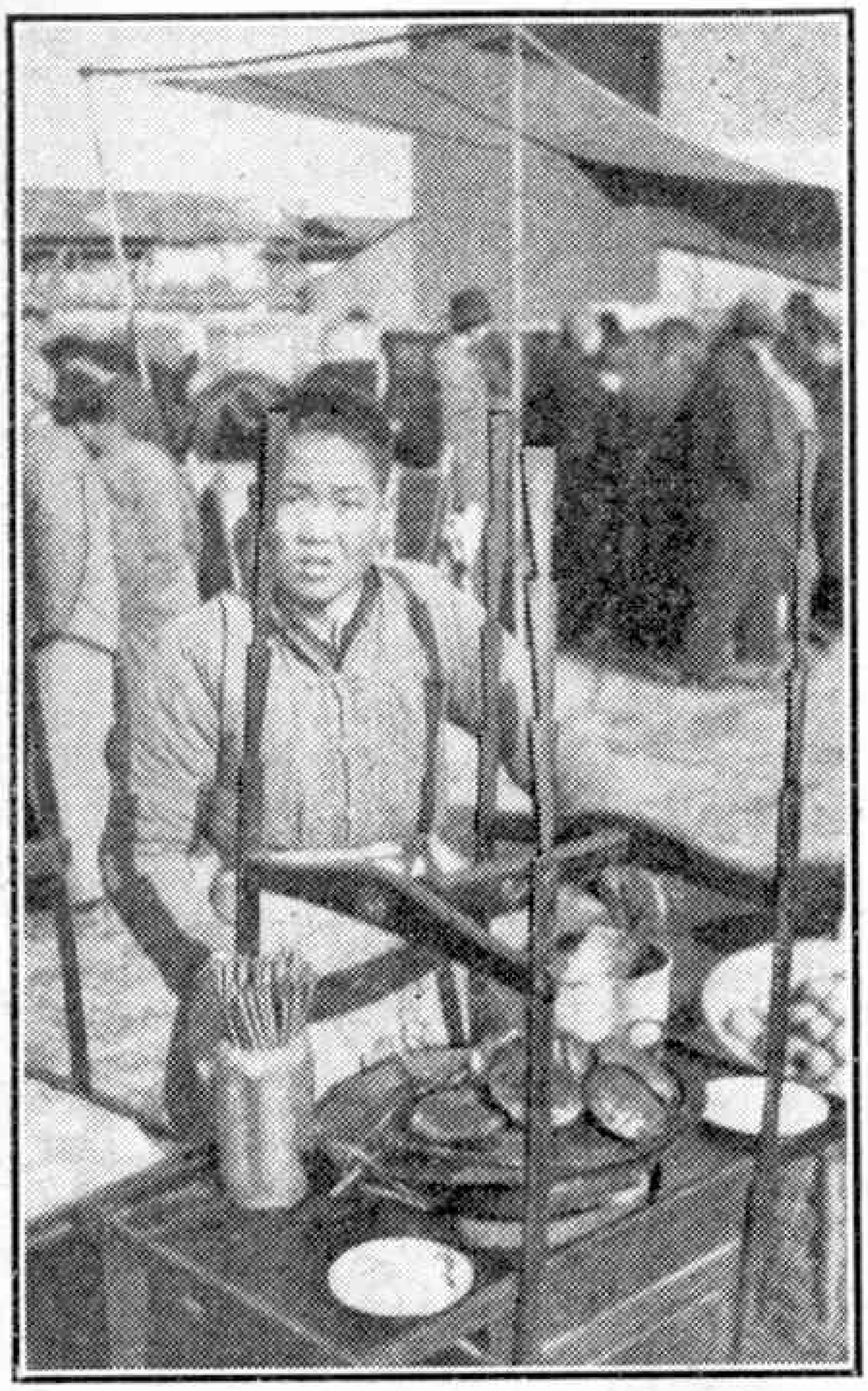
But in China there is always room for one more, and I managed to hew my way to a space in a goods van immediately behind the engine. It was one-third full of bales of cotton and the rest of the space was crammed with passengers and their baggage. Two or three were women, but no courtesy was lavished on the fair sex.

For twelve of the longest hours I have known I abode in that van while village stations went slowly past. In those days the train stopped at every station; and we had additional chances to stretch our legs when the engine balked at the steeper inclines and had to make two or three attempts before it could surmount them.

On another journey, this time from Kutsing to Kunming, I spent nine hours on a carriage roof exposed to the rain and wind and smuts that streamed back over the length of the train.

This short stretch of line in Yunnan was not typical of China's main railways, at least not altogether. It had nothing like the importance of the great Lunghai railway, which links the roads of Kansu Province with the Yellow River and the China Sea, or of the line that runs into the heart of China from Canton and the one that comes out of Kweichow and Kwangsi to meet it.

During the war only certain stretches of China's railway lines were open to traffic. The Japanese had the habit of taking over communications where possible,



Refreshments for the Chinese railway passenger. This Chinese boy keeps a portable restaurant near one of the large stations.

and bombing what they did not take over. Usually it was impossible to go to the end of a line; for somewhere or other there would be a bridge down and everyone would change trains.

The Lunghai was like that in the summer of 1943. The flooding of the Yellow River was followed by the usual famine, and the second harvest was ravaged by a plague of huge grasshoppers. Everyone tried to move out of the devastated area in search of food, and the quickest way to travel was along the railway.

Refugees swarmed in their thousands over the passing trains. They piled on the roofs and on the links between coaches until every square inch to which a human being could cling or be tied was taken. They roped their precious bundles of belongings beneath the train, where they swayed within inches of the track. With such cargoes of despair the trains moved along the Yellow River in that tragic summer. Hundreds were swept off the roofs in the tunnels, or fell off while they slept.

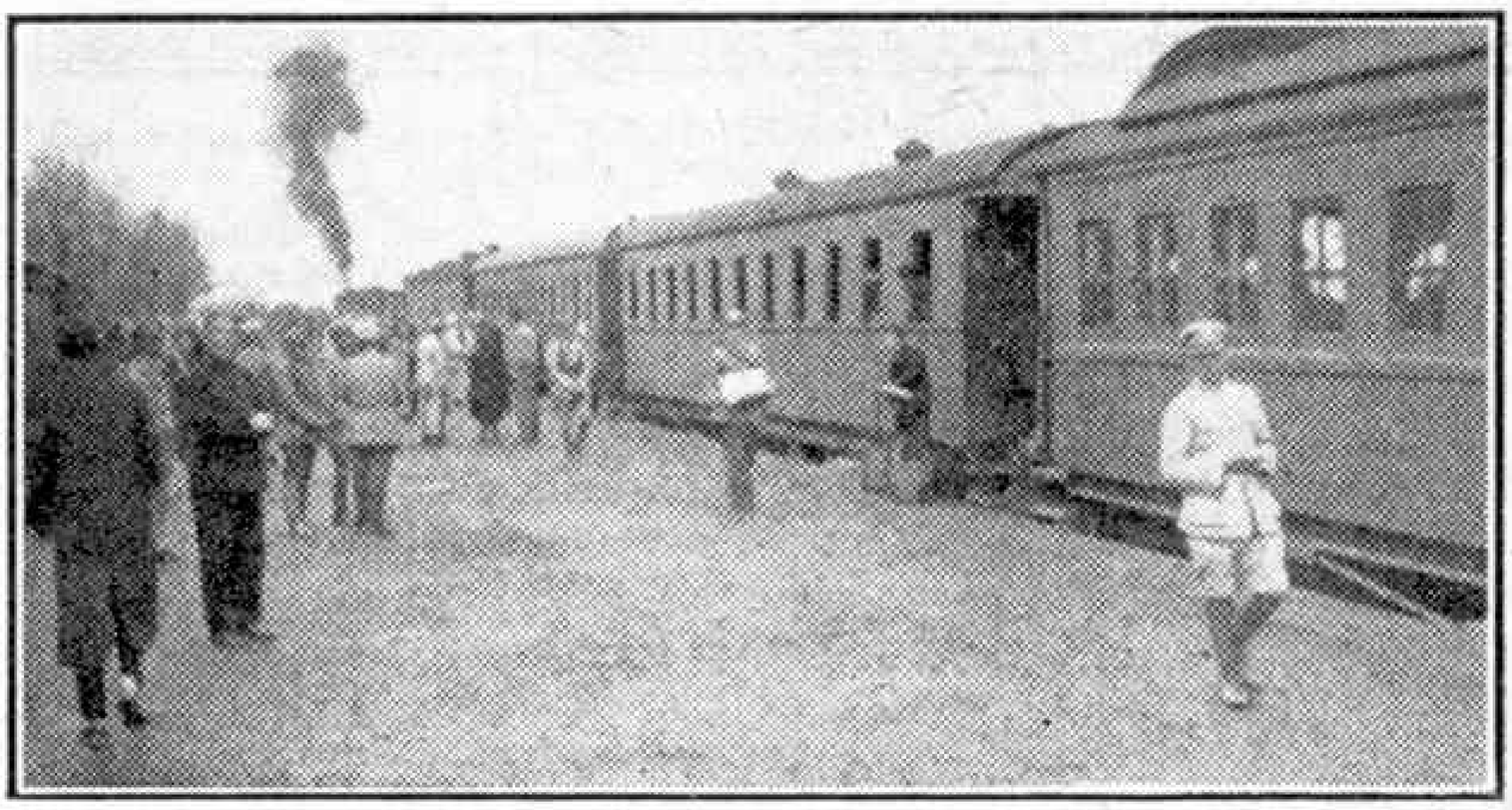
Along one stretch of the line the trains moved only by night, and those who could afford it sat in an armoured coach. This was where the Japanese guns across the river sometimes opened fire.

China's railway development has long been interrupted by war and its aftermath. Twenty years ago there were not more than 9,000 miles of track in the whole country, and the greater part of this was concentrated in the north and north east. A lot more would have been accomplished in the late thirties if the Sino-Japanese war had not broken out. As it was, the slow development was still further impeded, and the new lines that were opened, such as the Kowloon-Hankow, were soon blocked by the Japanese occupation.

A few months after its reopening, in 1946, I travelled from Canton to Hankow over a track that had suffered 800 air-raids in the first couple of years of its life. The bridges were still temporary, and creaked and groaned beneath us as we crossed slowly over them.

From Canton to Hankow is over 600 miles, and I was three days and two nights in the train, sprawling on an upper berth in a shabby second-class sleeper, or looking through the window at the changing landscape as we moved northward into the heart of a continent.

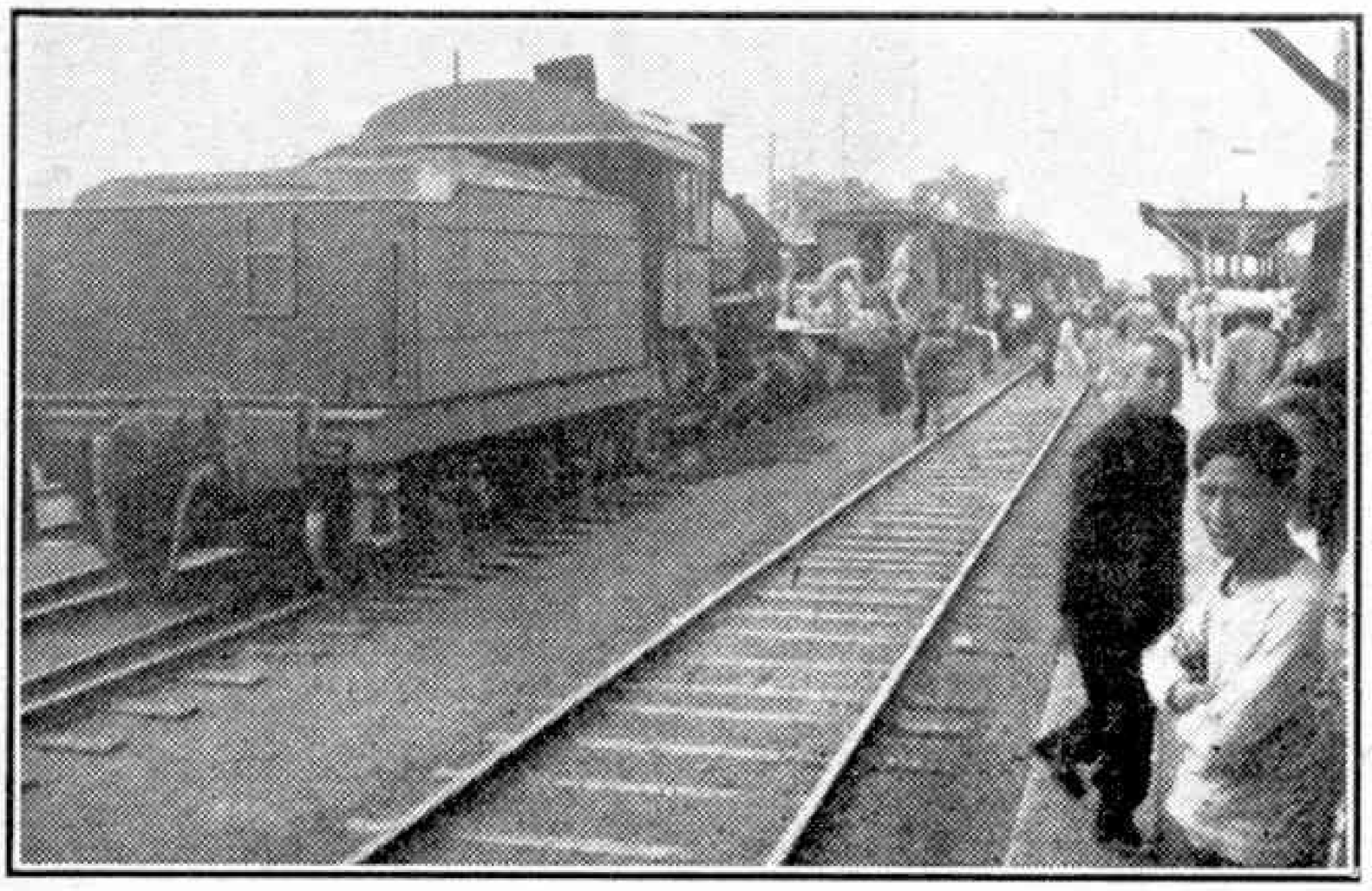
Chinese trains have much in common with any others. The worst are no shabbier than some trains I have travelled on in Europe; the best, such as the night train



The Canton-Hankow train stops at a station in Hunan.

from Nanking to Shanghai, will stand comparison with the best expresses in most countries.

But there are obvious differences. Come with me to the dining car on this Canton-Hankow train for a moment. "Dining car" is perhaps too pretentious a name for such a coach. Along both sides, underneath the windows, were tables set with chopsticks and tea bowls, and stools or rough benches for the customers. The waiters were two grubby cheerful boys who carried in the rice, vegetables and eggs from the kitchen adjoining.



Even a goods train in China is not without its quota of passengers.

In this coach I used to eat simple but excellent meals, watched by the train guards, for every train in China has its guards to protect against bandit attacks and prevent the entry of more than a certain number of non-paying passengers. When they had nothing better to do, which was quite often, they sat in the dining car picking their teeth.

On this train at night, with the smoke from the engine streaming away before a north wind that became colder as we sped on, I got the impression of a vast landscape that went on for ever. Occasionally the darkness was broken by yellow gleams from the oil lamps in village shacks set back from the line, and these became more numerous about the little stations, which glowed about us for a moment and were gone. In the shadows of their homes beside the track, people stood to watch the train pass, as if it were some miracle. At a level crossing near Changsha a group of children stood and cheered our engine, its fire-box bright with flame like the open mouth of a monstrous dragon.

I saw restaurants hazy with steam and bustling with activity; street stalls; and pedlars with cigarettes, or carrying portable "kitchens" from the ends of a bamboo pole slung across their shoulders. I saw all the life of a Central China town by the light of a few strings of incandescent bulbs and a thousand oil flames that flared in the wind.

Train journeys in China had their romantic side, but they could be grim too, for ordinary travellers as well as hapless refugees. The train that ran from Kowloon, opposite Hong Kong, to Canton, South China's greatest city, used to be known as the "Smugglers' Train." Just about every form of contraband used to be carried along it, disguised as personal baggage.

The single track from Kowloon to Canton is 122 miles long. The odd 22 miles are owned by the Hong Kong Government; the rest by the Chinese. On the Chinese section in 1949 anything could happen. Scarcely anyone bothered to pay the fare. Smugglers found the roofs of the coaches useful vantage points for dealing with the more persistent revenue men who could not be bribed. As for the engine driver, he did what he was told by the armed passengers, and halted where they told him to take on illicit cargoes.

During the fighting and chaos of the Civil War, when the main efforts of the authorities were occupied elsewhere, passengers on this Kowloon-Canton line took their lives in their hands whenever they travelled. I have already referred to the guards on Chinese trains, who were usually armed with old-fashioned German Mausers. But these were no match for the bandits who for a time haunted the Kwangtung hills and preyed on the passengers on the train. They had better equipment than the guards, and the wise passenger had more than the usual good reason for not leaning out of the window.

Nor was the danger always an external one. A passenger might find that the courteous gentleman (*Continued on page 286*)

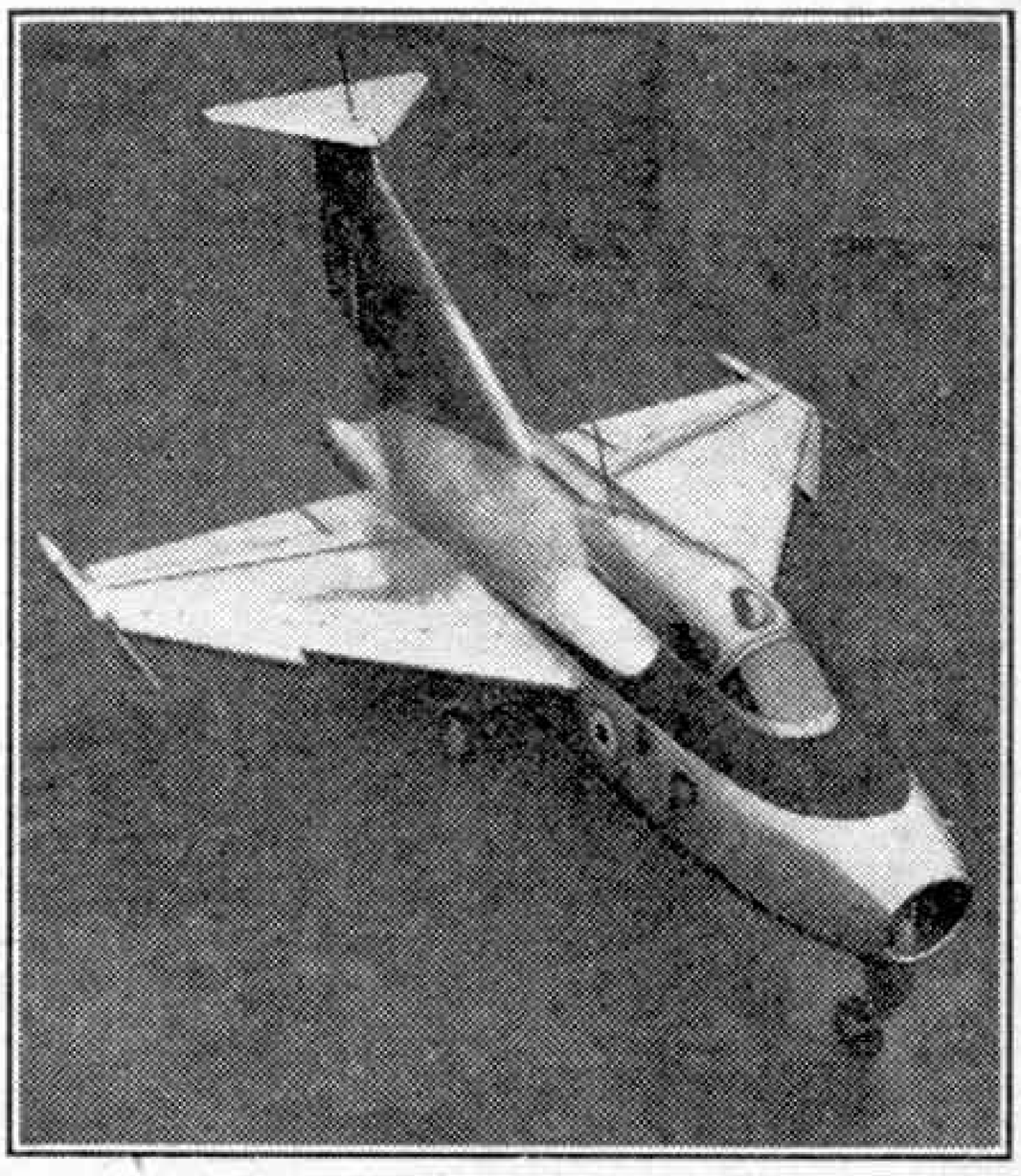
Air News

By John W. R. Taylor

New British Delta

The revolutionary little Fairey "Delta One," shown on this page, is the most advanced aircraft ever built in Britain to probe the secrets of high-speed flight. With a wing span of only 19 ft. 6½ in. and length of 26 ft. 3 in., it is by far the smallest delta ever built and, although intended solely for flight research, may well point the way to the ultra-fast target defence interceptor fighter of the future.

Its delta type of wing, so named because in plan view it resembles the Greek letter Δ, offers greater stiffness for high-speed flight than a conventional wing, plus plenty of room for fuel, guns or other equipment. Streamlined containers at each wing tip house anti-spin parachutes for use in any flight emergency, and a further large parachute, carried at the tail end of the fuselage, can be used also as a brake when landing. A tailplane and wing slats have been fitted for the first low-speed flight trials of the F.D.1, which is powered by a Rolls-Royce "Derwent" turbojet.



Fairey F.D.1, showing the delta type of wing. Photograph by courtesy of The Fairey Aviation Co. Ltd.

Airborne Tractor

A 10,000 lb. tractor recently flown from Melbourne to Flinders Island in an Australian National Airways' Bristol "Freighter" is the largest single item of freight so far handled by the company.

The tractor was consigned by the Australian Department of Civil Aviation for work on the island's aerodrome. Its width of 6 ft. 2 in. left only 5 in. clearance on each side of the aircraft's cabin, and a special earthen ramp had to be built at Flinders Island to facilitate unloading.

Atom-Powered Aircraft

News that the General Electric Corp. of America are being awarded a contract for development of a power plant that can be used with atomic fuel is the first indication that atomic-powered aeroplanes are considered on the way to reality within a few years. When built, the aeroplane will almost certainly be the biggest in the world, much larger than even the experimental 8-engined, 700-passenger Hughes "Hercules" flying boat.

The (Very) Last "Mosquito"

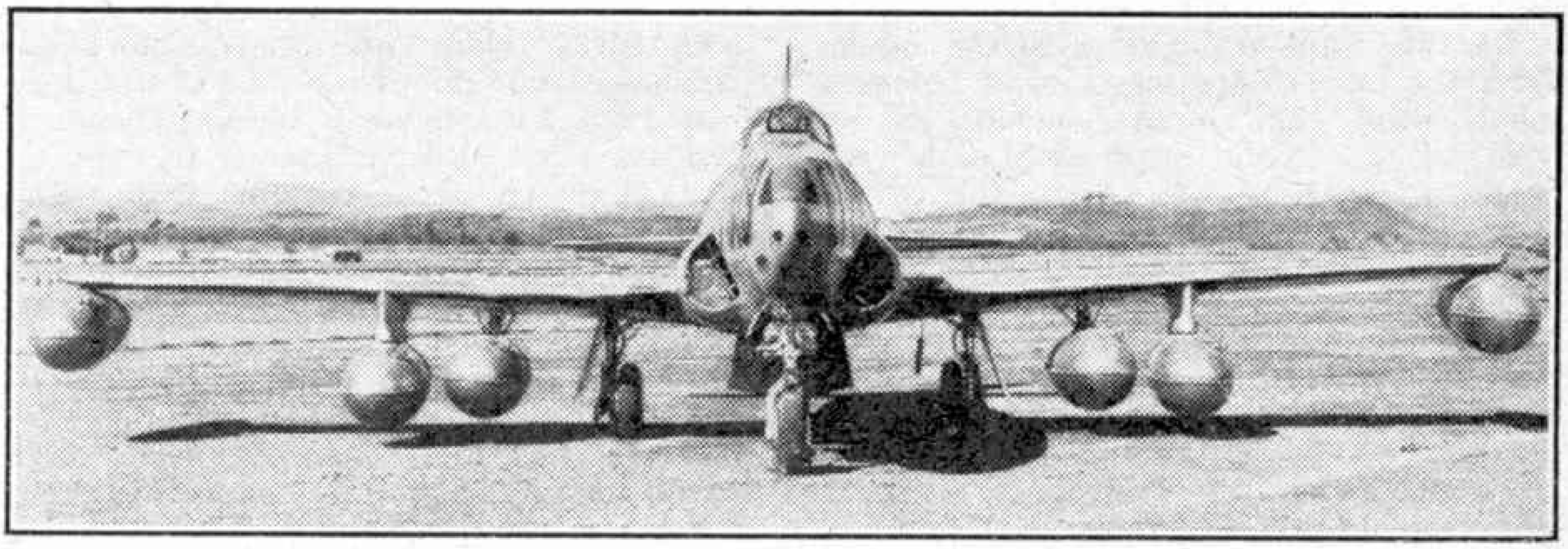
In April 1946 de Havillands announced that they had delivered the last "Mosquito." Shortly afterwards the R.A.F. placed a new order for "Mosquito" night fighters, and this was followed by further contracts. So it was not until this year that de Havillands were able to announce, with a certain amount of diffidence, that they had again delivered the last "Mosquito," a Mk. 38 night fighter, from their factory at Chester.

Altogether 7,781 "Mosquitoes" were built: 3,299 by de Havillands at Hatfield; 1,627 in their Leavesden factory; 81 at Chester; 1,134 by D.H. Canada; 208 by D.H. Australia; 1,065 by Standard Motors at Coventry; 245 by Percivals at Luton; and 122 by Airspeed at Christchurch.

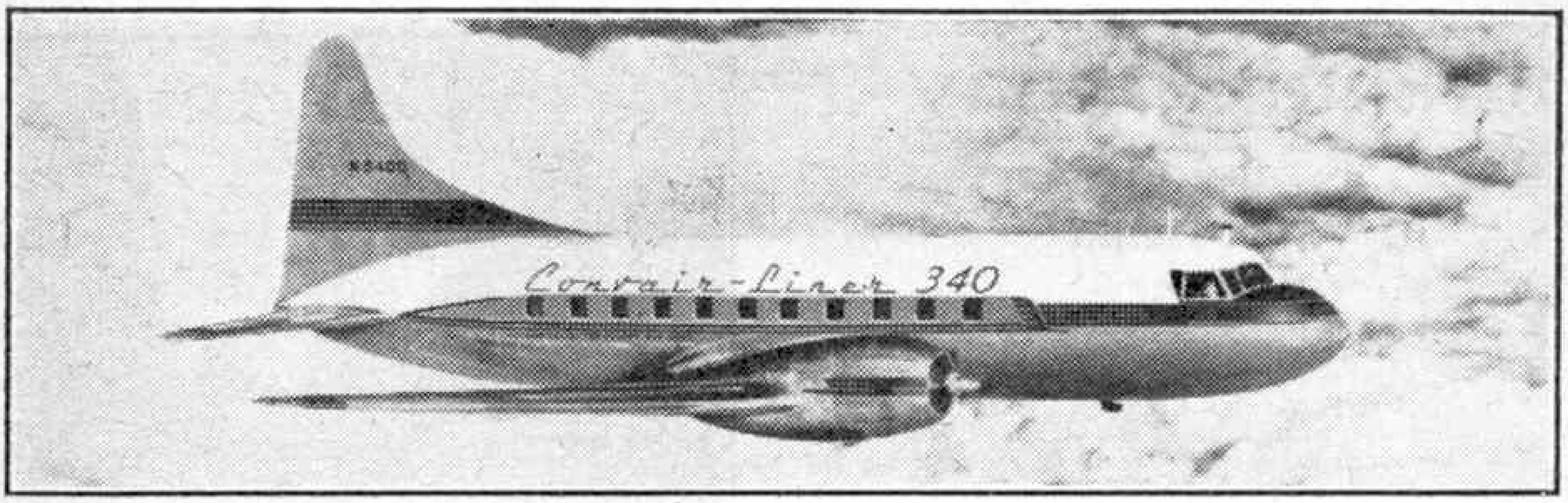
Flying Flame-Thrower

More than half of all fighter sorties flown in the first six months of the Korean War were made by Lockheed "Shooting Star" jet fighters of the U.S.A.F. During that time they dropped 1,662 tons of bombs, fired 49,873 rockets and 19,810,852 rounds of ammunition, and shot down 94 enemy aircraft, including the first MIG-15 jet destroyed in action.

Most devastating weapon used by the "Shooting Stars" was the Napalm fire bomb, six of which can be seen under the wings of the aircraft illustrated at the foot of this page. These bombs consist of 110-gall. fuel tanks filled with jellied petrol, and when dropped anywhere near a tank or other target quickly engulf it in flames and destroy it.



Lockheed F-80 "Shooting Star" in Korea loaded with six fire bombs. Photograph by courtesy of Lockheed Aircraft Corporation, U.S.A.



An artist's impression of the new Convairliner 340 twin-engined transport. Photograph by courtesy of Consolidated Vultee Aircraft Corporation, U.S.A.

Pacific Pioneer

Australia and Chile have been linked by air across the Pacific for the first time by Capt. P. G. Taylor, the famous Australian airman who made several epic pioneering flights with the late Sir Charles Kingsford-Smith in the 1930s. Purpose of the flight was to survey the 8,500-mile route from Sydney, through Suva (Fiji), Aitutaki (Cook Islands), Tahiti (Society Islands), Mangareva (Gambier Group) and Rapa Nui (Easter Island), to Valparaiso, for a possible future airline service between the two continents.

Capt. Taylor, who is a director of Trans Oceanic Airways, the Australian flying boat operators, used a "Catalina" named "*Frigate Bird II*" for the survey flight, and was accompanied by a crew of three.

A Bigger Convairliner

Within two weeks of their announcement of a new and bigger version of the popular Convairliner, Consolidated Vultee had received orders from four airlines for a total of 61 of the new machines, worth about £12½ million. United Air Lines have ordered 30, Hawaiian Airlines four, Continental Air Lines seven and Braniff Airways 20.

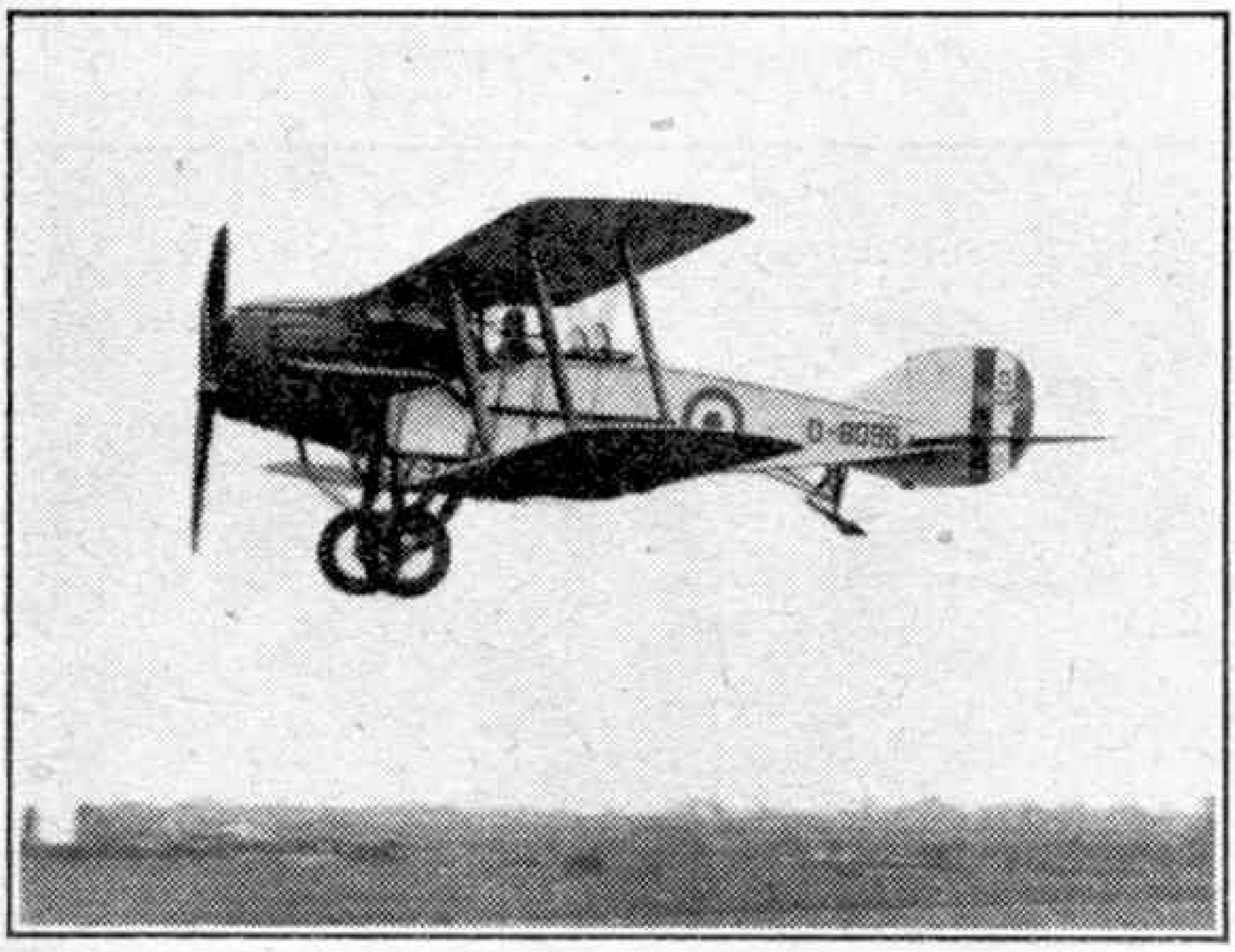
The new aircraft is designated the Convairliner 340, and is illustrated above. It has more wing area, a longer fuselage, higher gross weight and more powerful engines than the well-known Model 240, with interior design improvements. The Model 340 will carry 44 passengers and be powered initially by two 2,400 h.p. Pratt and Whitney R-2800 engines, but it has been designed for easy conversion to propjet power in due course.

"Viscounts" for Air France

Following the announcement that Aer Lingus have ordered four Vickers "Viscounts" comes news that Air France have decided to buy six of these fine British propjet-powered air liners for service on their London-Paris route. They will be flown in direct competition with B.E.A.'s new piston-engined "Ambassadors," as the British airline plan at present to reserve their "Viscounts" for longer routes such as those to Rome and Sweden, where better and more economical advantage can be taken of the time-saving qualities of the jets.

A Veteran Flies Again

On 14th February last, nearly 35 years after the prototype's first flight, a Bristol F.2B fighter was successfully test-flown by the company's Chief Test Pilot, A. J. Pegg. It has been rebuilt by Bristol's for the Warden Aviation Co., of Bedfordshire, on condition that it should be available for display or exhibition whenever required. Despite years of storage, both the airframe and its "Falcon" engine were in amazingly good condition, and Rolls-Royce found it unnecessary even to bench-test the engine after its overhaul.



A veteran flies again. The rebuilt Bristol F.2B fighter in the air. Photograph by courtesy of The Bristol Aeroplane Co. Ltd.

"Princesses" for the R.A.F.

The three Saunders-Roe "Princess" flying boats, originally intended to provide luxury first and third-class air services non-stop between Southampton and New York, are to be completed for R.A.F. Transport Command.

One can only regret that these magnificent aircraft will not play their part in putting Britain in the forefront of world airline operators; but it is better that they should be operated enthusiastically by the R.A.F., who realise their value, than by B.O.A.C. who do not. Each "Princess" will carry the equivalent of a whole squadron of "Hastings" four-engined landplane transports. The first of these flying boats is due to fly late this year.

* * *

Aer Lingus will operate almost 900 scheduled flights a month between London and Dublin during August and September next, providing accommodation for over 46,000 people in the two months. Included in this record number of flights between the two capitals are a thrice-weekly all-cargo service and thrice-nightly "Starlights," the popular reduced-fare night services.

Photography

By the Stream

By E. E. Steele

THE long hours of daylight and often high temperatures of "Flaming June" find most country-lovers spending more and more time by the streams and rivers, where endless delight awaits in the form of boating, fishing, and bathing, to say nothing of just idling and picnicking in the shade of the willows with the murmur of the stream in one's ears, the loveliest of all summer music.

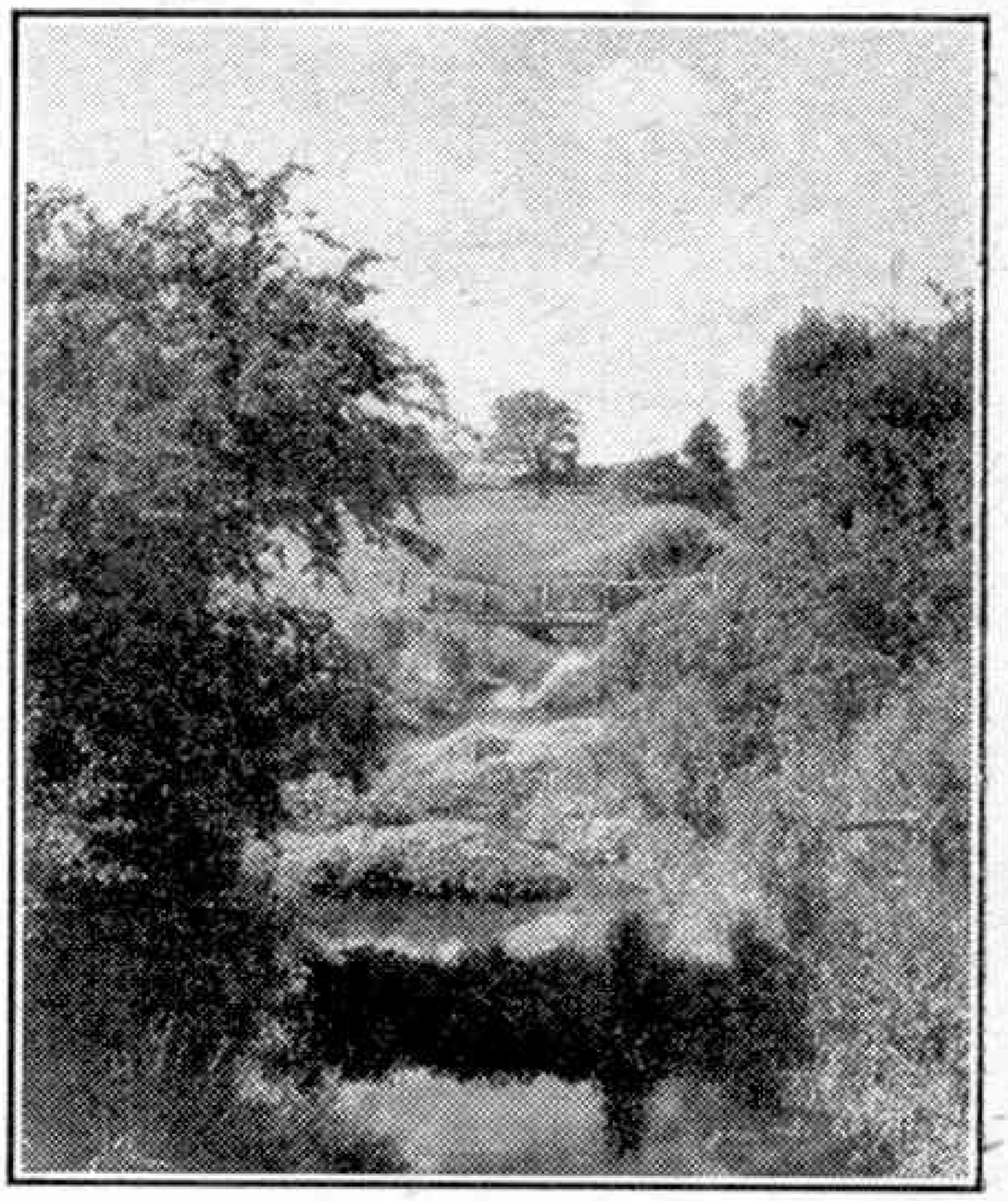
The early morning is especially fine, before the mists have quite melted away in the powerful rays of

Preparing for a big catch.

the sun, and the dew still sparkles on the grass; while the air is scented with all the marvellous perfume of June. Two or three companions with fishing-rods and a can of worms used to bring us into a paradise of absolute joy. I don't fish any longer, but I still get a kick out of catching fishermen with my camera, and together we spend a lot of time by the stream in June, and it's much greater fun than the boiling seaside.

There is now the brightest lighting conditions of the whole year and, as open river scenes need only half the exposure of normal subjects, we must be careful not to give too much, for strong, black negatives will give hard, contrasty prints, and lose many of the delicate tones we want to preserve. Sometimes a bold print can be made by deliberately pointing the camera towards the light thus giving a silhouette effect, but care must be taken that no rays of the sun actually shine into the lens or fogging will result. The use of an assistant's cap will prevent this if held so that it doesn't come into the picture.

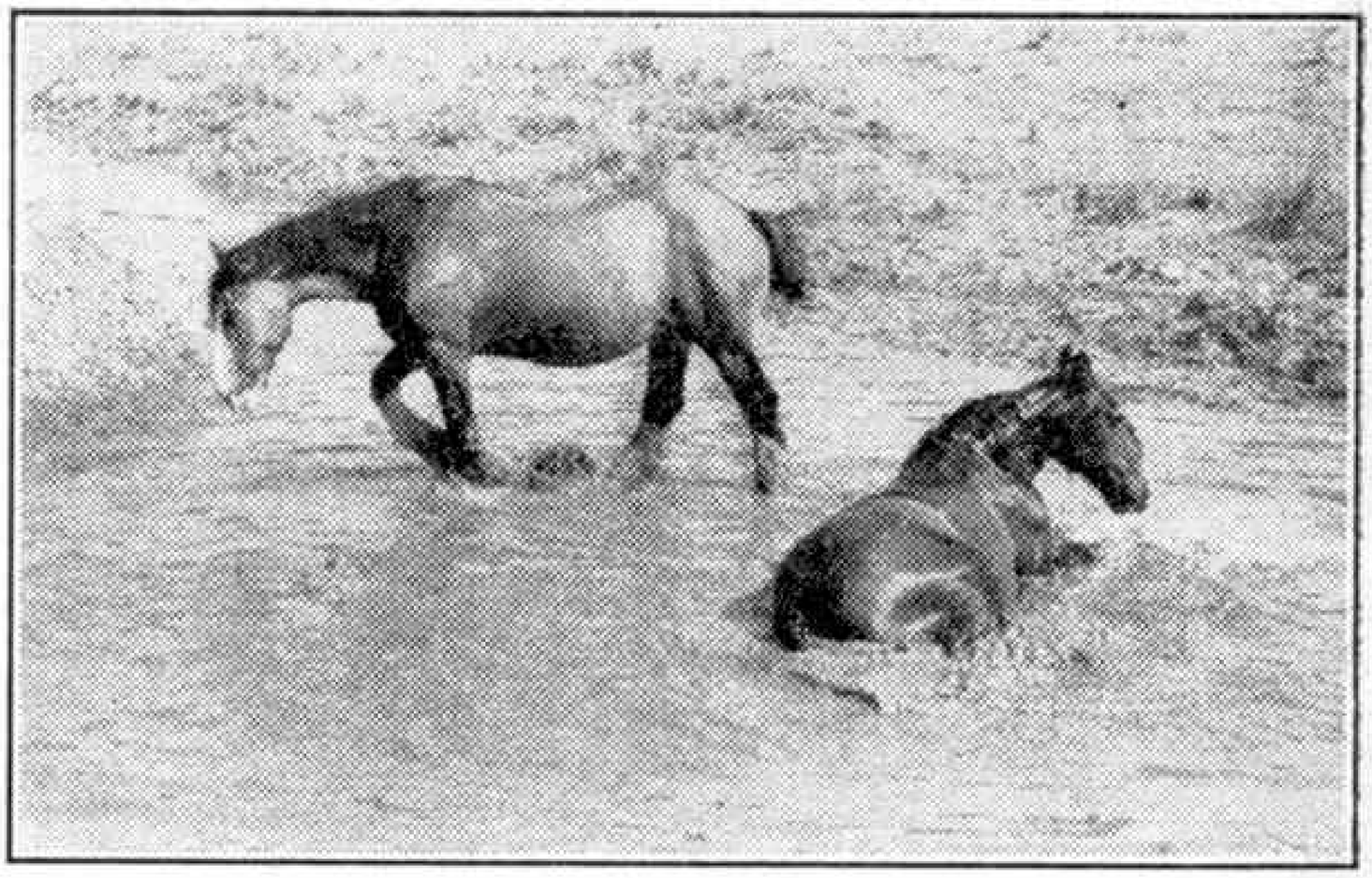
This is the month when boating holidays are popular, and small boats with crew of two or three, and probably boasting an outboard



Stream in Summer. The illustrations to this article are by the author.

motor, may frequently be seen upon our inland waterways, tying up for the night to a peg on the bank. These slow moving craft are easy game for the photographer, and the sail may usually be spied a mile or more before the boat comes abreast.

Along the smaller streams passing through the water meadows, horses and cattle may be found drinking, bathing, and taking their own particular pleasure in the cool water. Where the river flows between high banks horses are often met with grazing on top of the bank, which is a splendid position for photographing them outlined against a background of light summer cloud. Trees, small bridges, and bends in the stream all make interesting pictures if the right viewpoint is chosen. Along the margin of the stream one may come across the grass snake, who loves to coil in the hot sun. If alarmed the snake will readily take to the water, and is a graceful swimmer.



Horses bathing.

Meccano Competitions

By "Spanner"

"MOST USEFUL MECCANO PARTS" VOTING CONTEST

In order to provide Meccano model-builders with a Contest that will enable them to keep in touch with their hobby, and yet be free to spend as much time as possible out in the open air, we have decided to arrange a special summer competition. It is a voting contest of such a nature that competitors can just as easily prepare their entries on the sea-shore, or in the country, as at home. The only things needed are a pencil and a postcard. There is no model-building to do, or any other work that necessitates staying indoors.

In the upper panel on this page will be found a list of 12 parts taken from the complete Meccano range. Competitors are asked to study the list carefully and then to choose (A) the part that they think is the most useful and that can be used in the greatest variety of ways in model-building; and (B) the four parts that they think will receive the most votes when the "A" votes of all competitors are added together. When they have made their final selections, competitors must write the names of the parts, together with the Meccano catalogue numbers, on a postcard, which must also bear their full name and address.

The prizes will be awarded to the competitors who succeed in correctly forecasting the four parts that will receive the highest votes. If no competitor succeeds in placing the four parts in the correct order, the prizes will be awarded to the competitors whose entries are most nearly correct, in order of merit. There will be one Section only, and the Contest is open to competitors of all ages living in any part of the world.

The prizes to be awarded are listed in the lower panel on this page.

The closing date for receipt of entries from both Home and Overseas competitors is 29th September, 1951. The time allowed will permit readers who live in distant countries ample opportunity to submit their entries.

No competitor may submit more than one attempt. Entries should be addressed "*Meccano Parts Voting Contest, Meccano Ltd., Binns Road, Liverpool 13.*"

"MOST USEFUL PARTS" VOTING CONTEST

Select Your Parts From This List

1.	Part No.	10.	Fishplate
2.	" "	11.	Double Bracket
3.	" "	24.	Bush Wheel
4.	" "	48a.	Double Angle Strip $2\frac{1}{2}" \times \frac{1}{2}"$
5.	" "	62.	Crank
6.	" "	63.	Coupling
7.	" "	109.	Face Plate
8.	" "	115.	Threaded Pin
9.	" "	116.	Large Fork Piece
10.	" "	126.	Trunnion
11.	" "	126a.	Flat Trunnion
12.	" "	137.	Wheel Flange

PRIZES OFFERED IN THESE COMPETITIONS

"Mechanism" Contest

A separate set of prizes as follows will be awarded in each Section.

1st Prize .. Cheque for £3 3s. 0d.
2nd Prize .. Cheque for £2 2s. 0d.
3rd Prize .. Cheque for £1 1s. 0d.
Five Prizes each of 10/-

"Most Useful Parts" Contest

1st Prize .. Cheque for £2 2s. 0d.
2nd Prize .. Cheque for £1 1s. 0d.
3rd Prize .. Cheque for 10/-
Five Prizes each of a Postal Order for 5/-

THE MECCANO "MECHANISMS" CONTEST
Have You Sent In Your Entry?

This is a reminder for those readers who intend to take part in the interesting "*Mechanism*" Competition announced in the May "*M.M.*" but have not yet sent in their entries. There is still time to take this chance of winning a fine Cash Prize, for the Home Section of the Contest will remain open until the 30th June, while in the Overseas Section entries will be received up to 29th September next.

For the benefit of intending competitors who did not see the May announcement, we are again giving the main details of the Competition, which are as follows:

The Competition is open for entries consisting of some form of mechanism which depends for its operation on a screw gear or Screwed Rod. Typical examples of a suitable entry are an ordinary car jack or an automatic gear change in which the gears are changed by the movement of a Threaded Boss along a rotating Screwed Rod.

It is not necessary to build a complete model. All that is required is just a section of a model embodying some movement or effect obtained with the aid of screw gear.

Each entry must be original and the result of handiwork, both in design and construction.

Actual models must not be sent. It is only necessary to submit either a clear photo or a good drawing together with a short description of the mechanism. The competitor's age, name and address are to be written on the back of all photos or drawings sent. Entries will be divided into two Sections; A, for readers of all ages residing in the British Isles, and B, for readers residing Overseas. Envelopes containing entries are to be addressed to "*Mechanisms Contest, Meccano Ltd., Binns Road, Liverpool 13.*"

The prizes to be awarded in each Section are listed in the lower panel on this page.

MODEL-BUILDING COMPETITION RESULTS

Christmas "Toys and Games" Contest (Home Section)

First Prize, Cheque for £3/3/-: C. E. Wrayford, Bovey Tracey, Devon. Second Prize, Cheque for £2/2/-: E. Lynton, Brighton 7. Third Prize, Cheque for £1/1/-: B. Robinson, Belfast.

Five Prizes each of 10/6: I. Rolfe, Hornchurch, Essex; S. W. Croxtall, Leicester; A. E. Pearson, Redcar, Yorks; B. R. Harris, London S.E.18; D. K. Thomas, Plymouth, S. Devon.

Five Prizes each of 5/-: J. Ashbrook, Manchester 16; J. K. Zaw, London S.W.20; F. Curtis, Birmingham 8; D. Hardy, Blackwell, Derby; M. Watts, Pontypool, Mon.

Among the Model-Builders

By "Spanner"

Meccano at the B.I.F.

One of the fine Meccano working models shown at the British Industries Fair this year, was an illuminated reproduction of the Tower Bridge, London. A photograph of this model, taken during its construction, is reproduced on this page, but the finished model exhibited at the Fair, had much longer approaches. The illustration here can give no idea of the magnificent appearance of the actual model, in which the constructional details were specially planned to give very pleasing and effective contrasts between the striking red and green colours of the Meccano parts. The bascules were opened and closed automatically, the driving mechanism being of a very simple but reliable nature, and the model worked continuously throughout the eleven days the Fair was open.

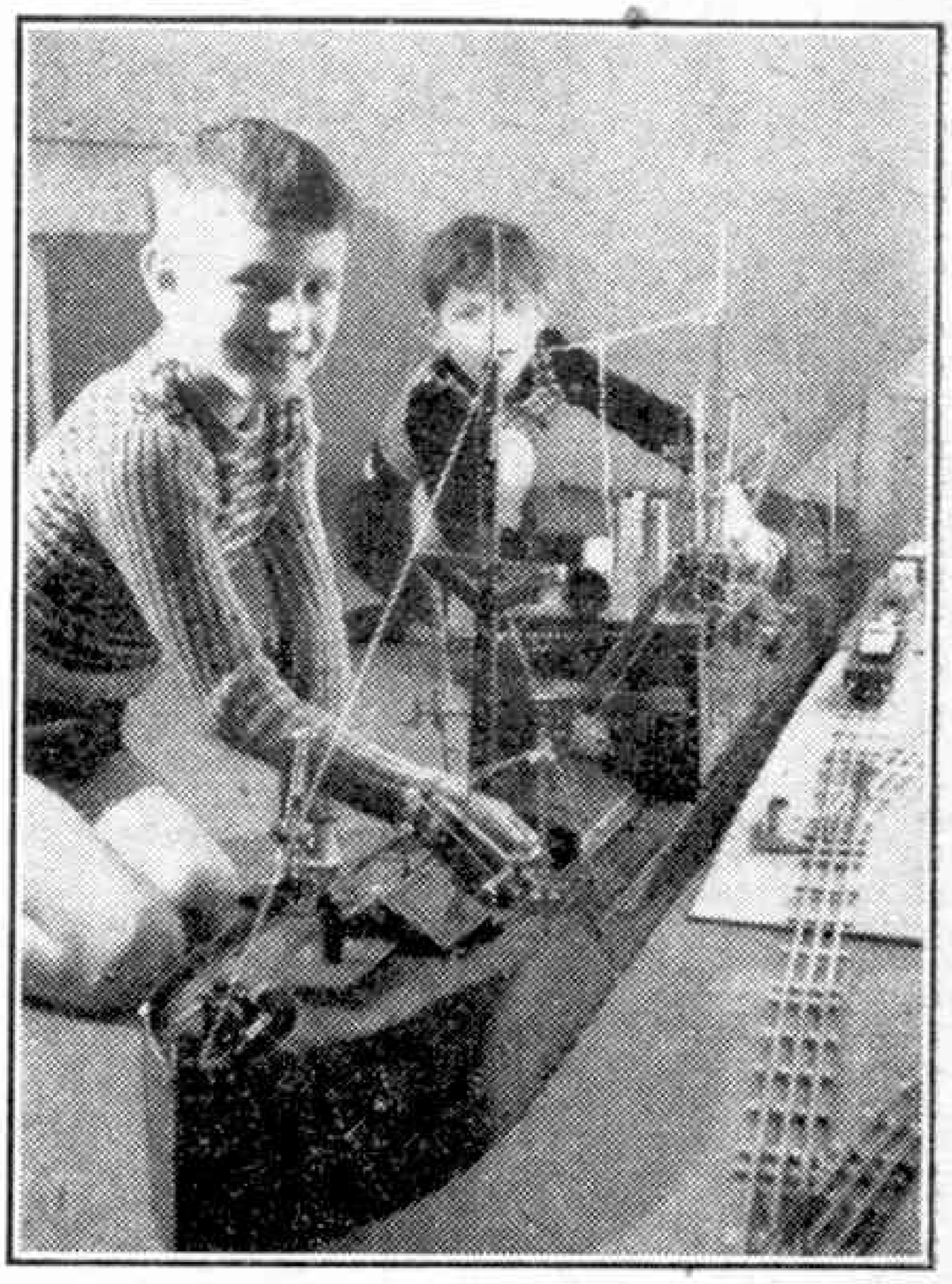


Fig. 1. Two Swiss Meccano boys playing with a model cargo ship built by their father, Mr. Meyer-Keller, Baden, Switzerland.

An Auto-Change Gear-Box

Mr. H. Taylor, Huddersfield, is a very keen and experienced Meccano model-builder and has spent much of his leisure time in constructing various types of looms, on which subject he is an authority. One very fine ribbon loom he designed is to be described in the *"M.M."* as soon as circumstances permit. Mr. Taylor also delights in developing new and unusual types of mechanisms, and recently he provided me with details of an ingenious auto-change gear-box he has devised. In this mechanism changes of gear are brought about entirely automatically, and the device is sufficiently adaptable for modification to fill a useful purpose in several types of machines.

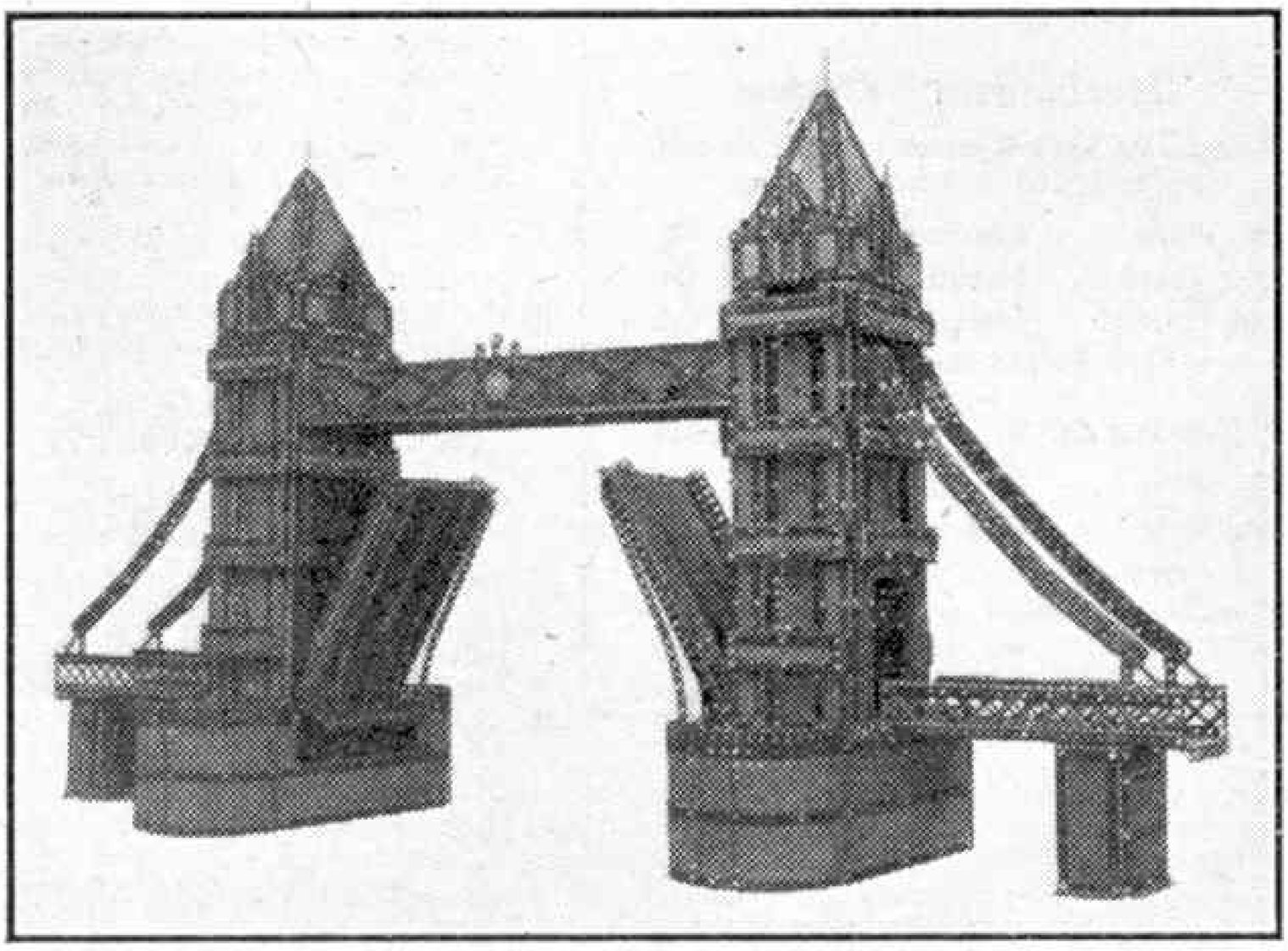


Fig. 2. The Tower Bridge model that formed an exhibit on the Stand of Meccano Ltd., at the British Industries Fair, in London. Some details of it are given on this page.

The framework for the mechanism can be varied to suit the particular model in which it is used, but the frame shown in Figs. 3 and 4 consists simply of a vertical 5½" and a 7½" Angle Girder on each side bolted at their lower ends to a 7½" Angle Girder, and connected by a 5½" Angle Girder 1. Two 5½" Angle Girders 2 connect the sides together, and these

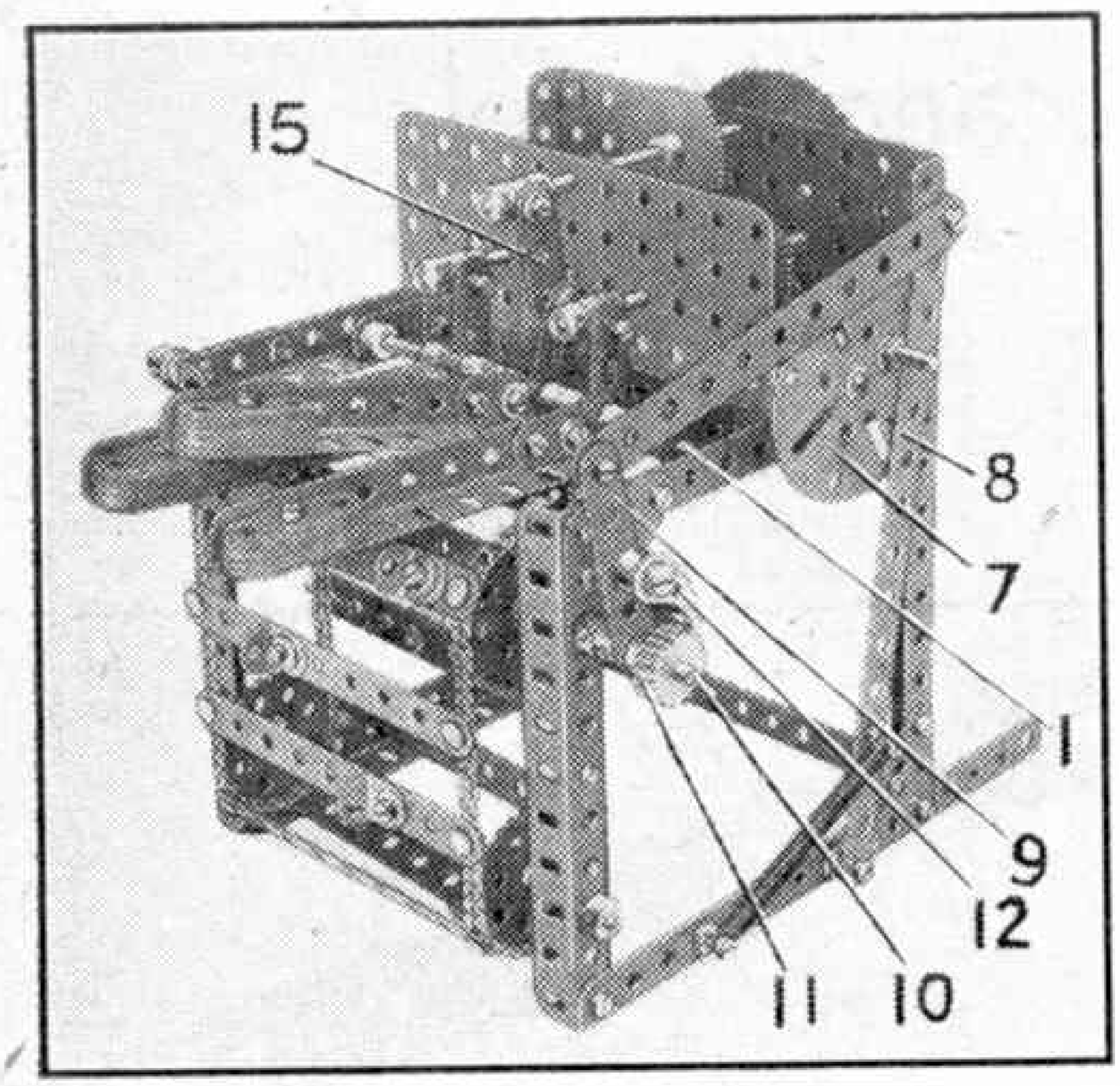


Fig. 3. A novel gear-box in which the change is operated automatically. It was designed by Mr. H. Taylor, Huddersfield.

Girders serve as supports for $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flat Plates that provide bearings for the gear-box shafts.

The drive to the gears is taken to a Rod 3 that is fitted with a $\frac{3}{4}''$ Pinion 4 and a Worm 5. The mechanism shown is arranged to provide three separate drives, and each of these is obtained by sliding a Rod carrying a 50-tooth Gear 6, so that the Gear is moved into mesh with Pinion 4. The sequence and duration of any of these drives can be varied within limits simply by adjusting stops on a moving chain.

The Worm 5 is in constant mesh with a $\frac{3}{4}''$ Pinion fixed on a Rod mounted in 1" Corner Brackets bolted to the Girders 1. The Rod carries a Face Plate 7 fitted with a Threaded Pin, and a $7\frac{1}{2}''$ Strip 8 pivoted at its lower end bears against the Threaded Pin. A Tension Spring is used to hold the Strip against the Pin, and a lock-nutted $5\frac{1}{2}''$ Strip links the Strip 8 to a $2\frac{1}{2}''$ Strip 9 that is bolted to a Crank. The Crank is free to pivot about a Rod 10 fitted with a Ratchet Wheel 11, and a Pawl 12 pivoted on the Strip 9 engages the teeth of the Ratchet. This mechanism is arranged so that as the Face Plate rotates the Strip 8 is rocked under the action of the Threaded Pin, and this movement is conveyed to the Strip 9. The Pawl 12 pivoted on this Strip transmits the movement to the Ratchet, and thus Rod 10 is rotated intermittently. A Ratchet and Pawl 13 are used to prevent the Rod from turning in the reverse direction during the idling stroke of the Strip 9.

Rod 10 carries two $1\frac{1}{2}''$ Sprockets, and these are linked by endless Chains to similar Sprockets on a lower Rod. A series of $4\frac{1}{2}''$ Strips is attached to the Chains by paper clips as shown. The lugs of the clips must be bent so that the Chain rides freely on its Sprockets.

The weighted levers operating the movements of Gears 6 are $4\frac{1}{2}''$ Angle Girders, fitted with Bell Cranks that are pivoted on a Rod 14. The levers are held in position by Collars on the Rod. The outer levers are directly coupled to their sliding shafts by bolts passed through the Bell Cranks into Collars on the shafts. These bolts are fixed by nuts so that the Collars are free on the shafts, but each is loosely held between two fixed Collars. The centre lever is connected by a lock-nutted bolt to a $1\frac{1}{2}''$ Strip 15 locked to a Collar free between two fixed Collars.

The Gears 6 are engaged with their Pinion by Angle Brackets bolted to the $4\frac{1}{2}''$ Strips fixed to the Chains. These Angle Brackets raise the weighted levers so that the Gears slide into mesh. As the Chains rotate the Angle Brackets allow the levers to fall and disengage the gears.

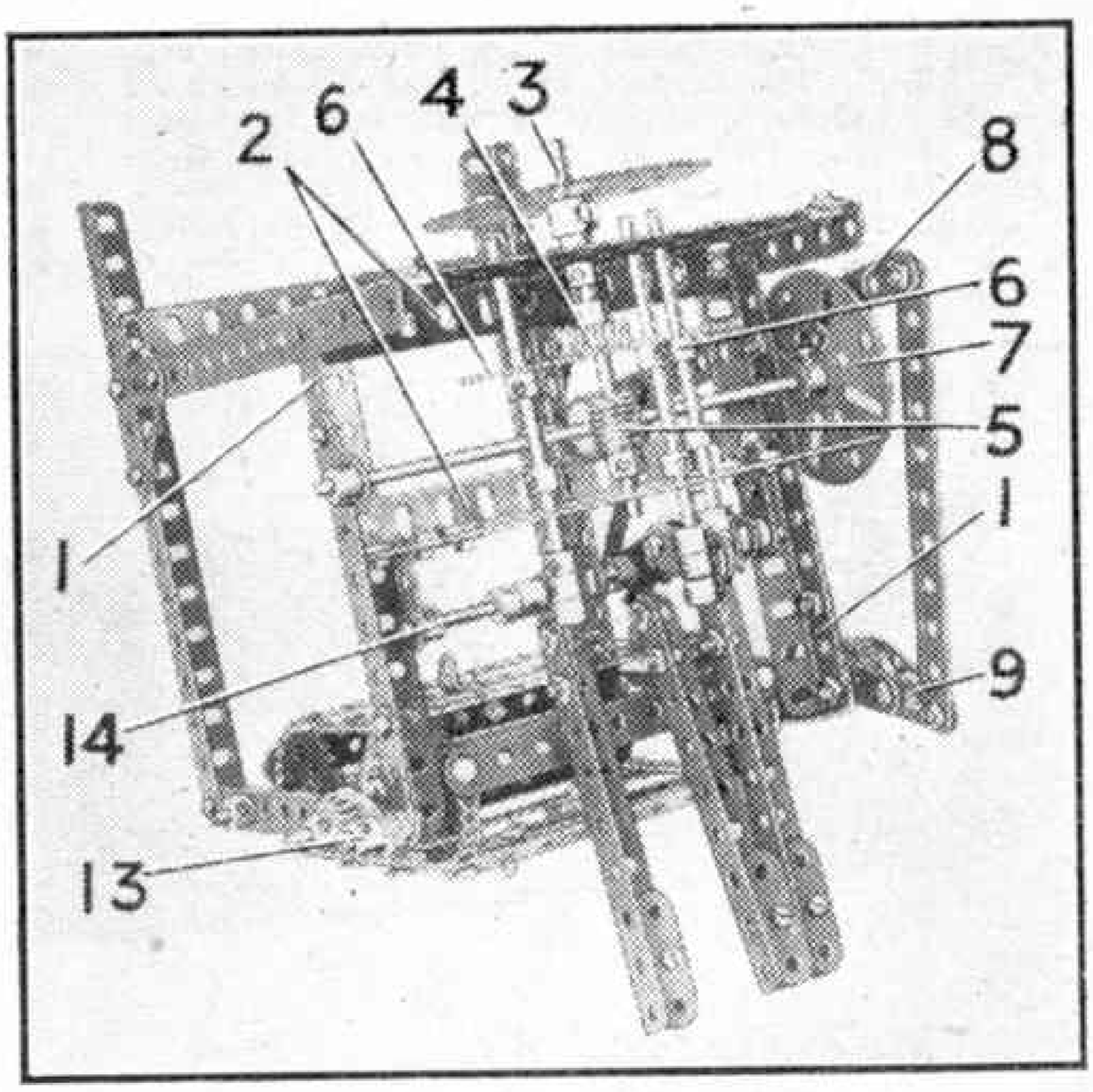


Fig. 4. A plan view of the auto-change gear-box shown at the top of this page.

New Meccano Model

Fire Engine and Escape

OUR new model this month is a realistic fire engine fitted with a turntable escape that reaches to over 3 ft. when fully extended. The model is powered by an E20R Electric Motor, and is fitted with a simple but effective steering mechanism.

The chassis is formed by two 18½" Angle Girders 1, connected at the front by a 2½" Angle Girder and at the rear by a 5½" Angle Girder 2. Three further 5½" Angle Girders, shown at 3 and 4 in Fig. 2, are bolted across the chassis to provide supports for the bodywork.

The rear wheels are fixed on a Rod mounted directly in the chassis members as shown. The Rod is held in position by Collars, and it carries a ½" Pinion 5 fixed between Girders 1. The front wheels are free to turn on 1½" Rods held in the logitudinal bores of Couplings 6. The Couplings pivot on 1" Rods passed through the end holes of three 3½" Strips 7 bolted across the chassis, and each Rod carries a Crank at its lower end. The Cranks are linked by a 3½" Strip attached by lock-nutted bolts, and a 2½" Strip 8 also is free to pivot on one of these bolts.

The sides of the body are assembled on 9½" Angle Girders 9 and 2½" Angle Girders 10, bolted to Girders 2, 3 and 4. Girders 9 and 10 are extended upward by 5½" × 1½" and 2½" × 1½" Flexible Plates, and the upper edges of the Plates are braced by further 9½" and 2½" Angle Girders 11 and 12. Girders 11 and 12 on each side are connected across by 5½" Angle Girders, and a 7½" Angle Girder 13 and a 2½" Angle Girder 14 are bolted to the cross 5½" Girders. The Girders 13 and 14 are extended upward by 5½" × 1½" Flexible Plates, and the upper edges of these Plates are braced by a 12½" Angle Girder 15 on each side.

An E20R Electric Motor is bolted by its flanges to the chassis as shown in Fig. 2, and a ½" Pinion on the Motor is meshed with a 57-tooth Gear fixed on a Rod mounted in the Motor side-plates. The Rod is fitted also with a ½" Pinion that meshes with a ¾" Contrate carried on a Rod 16. Rod 16 is mounted in Girders 4, and a Worm on the Rod meshes with ½" Pinion 5. A Threaded Pin is fitted to the Motor

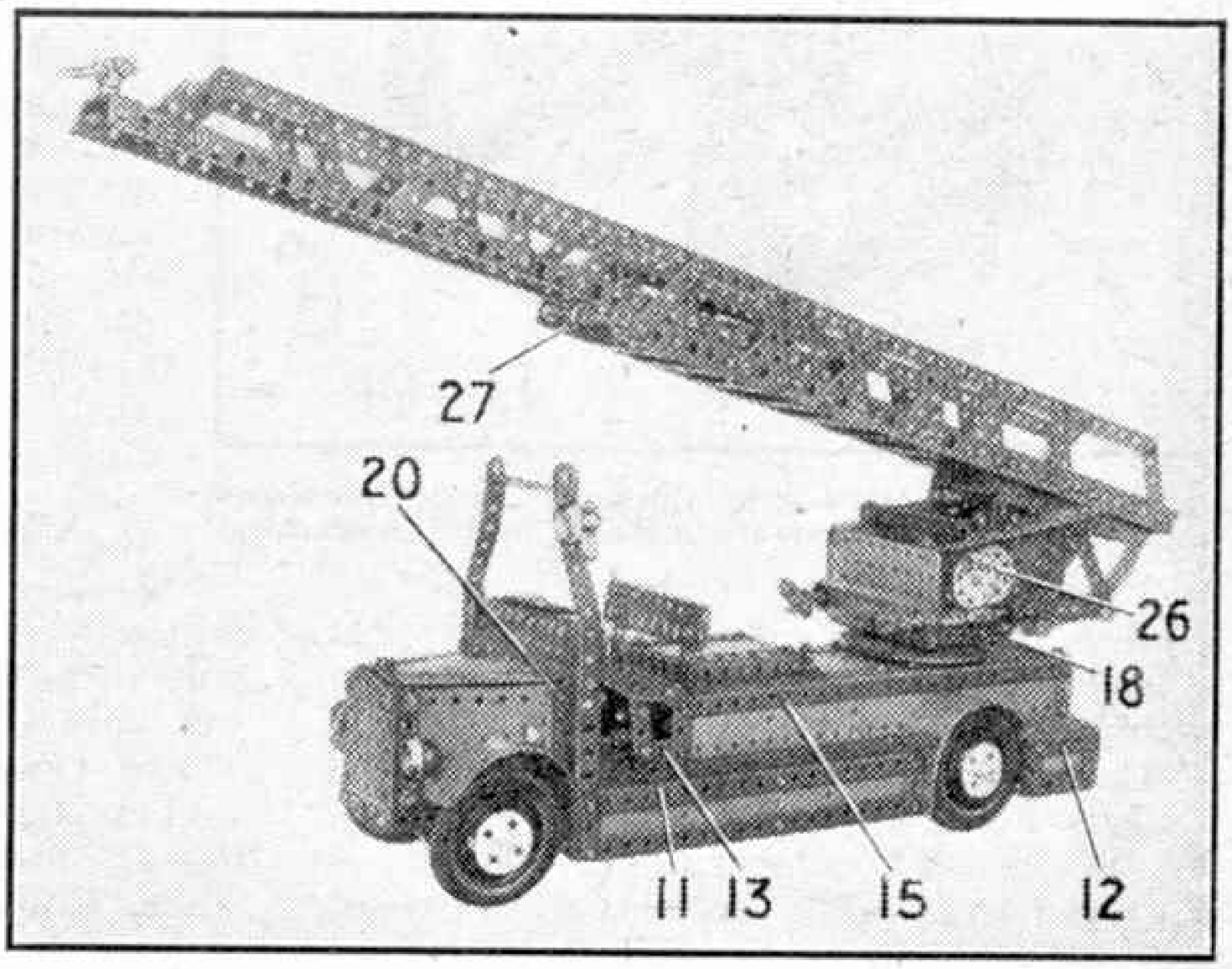


Fig. 1. An electrically driven fire engine fitted with an escape extending to 3 ft.

control switch, and engages a Crank 17. The Crank is fixed on a Rod mounted in a Double Bracket bolted to a 4½" × 2½" Flat Plate forming the floor of the cab, and the control rod is fixed in a Coupling carried on the same Rod as the Crank.

The Angle Girders 15 on each side are connected by a 3½" Angle Girder 18 and a 5½" × 3½" Flat Plate 19. A cover over the Motor is assembled from a 3½" × 2½" Flexible Plate edged by Angle Girders and bolted to Girders 15. The driving seat is made from a 4½" Angle Girder and three 4½" Flat Girders, and it is attached as shown in Figs. 1 and 4.

A 5½" × 2½" Flat Plate 20 is attached to a 5½" Angle Girder bolted across the floor of the cab, and is edged by a 3½" Angle Girder on each side. The 3½" Girders are extended by 5½" Strips to form supports for the escape. The sides of the bonnet are 3½" × 2½" Flexible Plates, and they are bolted to 2½" Angle Girders fixed to Flat Plate 20.

The steering column is a Rod mounted in

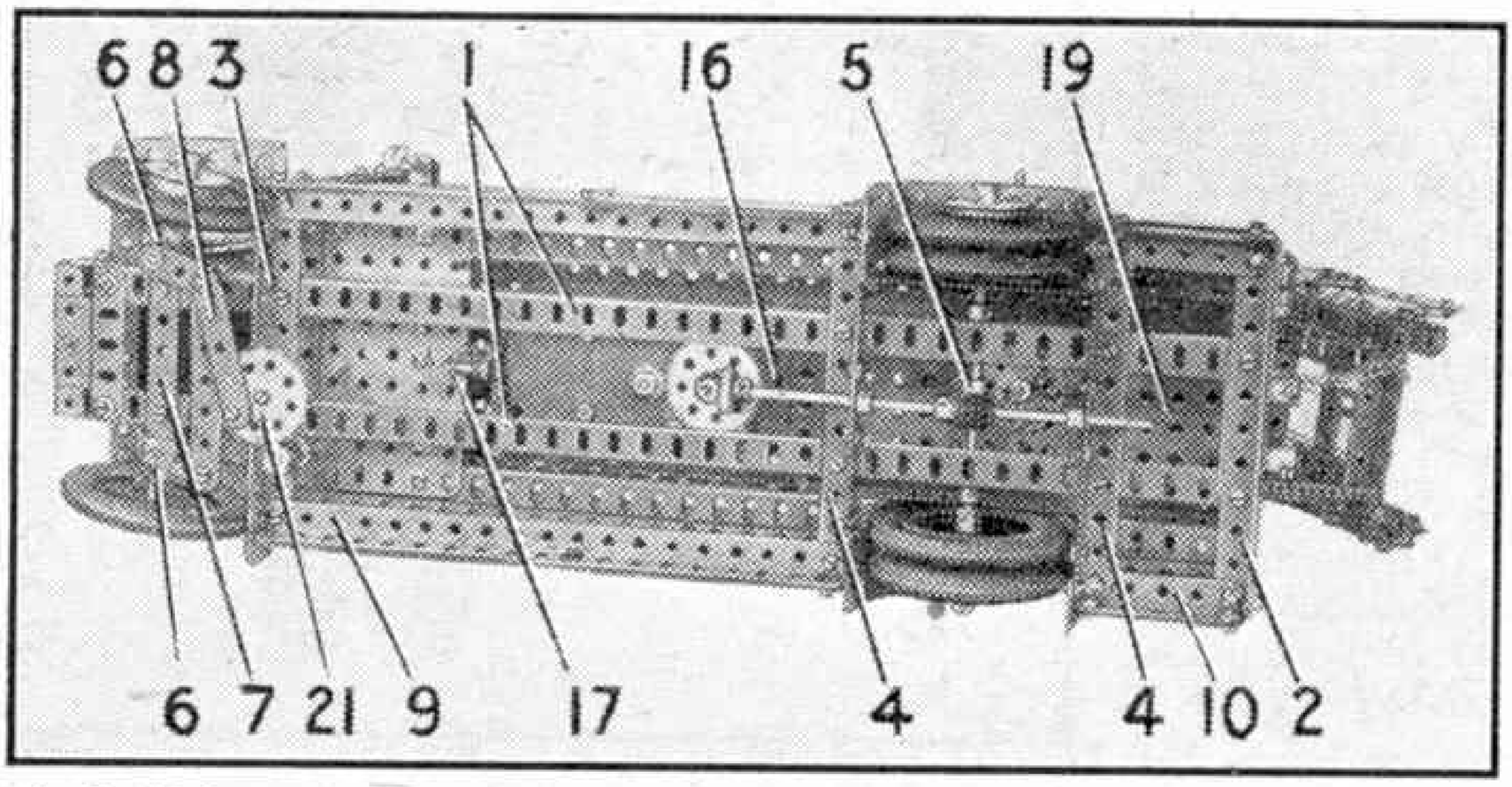


Fig. 2. Underneath view of the fire engine showing the drive to the rear wheels and the steering gear.

the floor of the cab and in a Fishplate fixed to Girder 3. The lower end of the Rod carries a ½" Pinion that meshes with a 57-tooth Gear 21, free to turn on a ¾" Bolt locked by nuts to Girder 3. The Strip 8 of the steering mechanism is lock-nutted to Gear 21.

The escape pivot is provided by a Ball Bearing unit. The lower section is bolted to the Flat Plate 19, and the upper section has two 2½" Angle Girders bolted to it. A 2½" × 2½" Flat Plate is fixed to each Angle Girder, and vertical 2½" Girders bolted to the Plates are connected by a 4½" × 2½" Flat Plate 22. A 5½" Angle Girder 23 and a 4½" Angle Girder 24 are bolted to each 2½" × 2½" Flat Plate, and the outer ends of the Girders are bolted together. The bolt is passed through the end hole of Girder 24 and the next to end hole of Girder 23. A 2½" × 1½" Flexible Plate is used to fill the gap between Girders 23 and 24. A 2" Rod is passed through the Ball Bearing and is held in place by a Collar and a Bush Wheel.

The escape is bolted to a swivelling platform consisting of two 5½" and two 2½" Angle Girders, and fitted at each side with a semi-circle made from four 2½" Curved Strips. The Curved Strips on each side

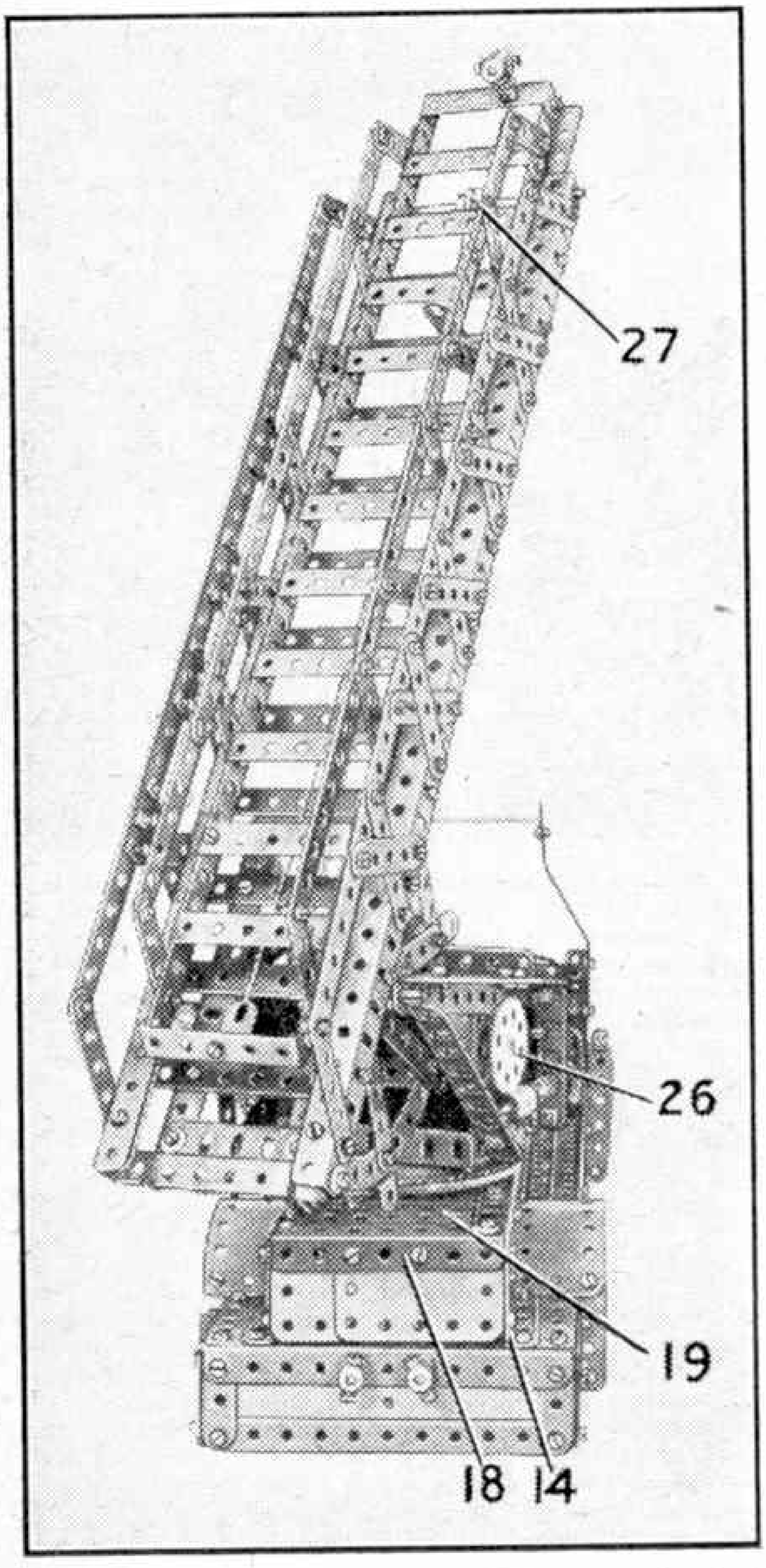


Fig. 3. A rear view of the extended escape showing the arrangement of the operating cords.

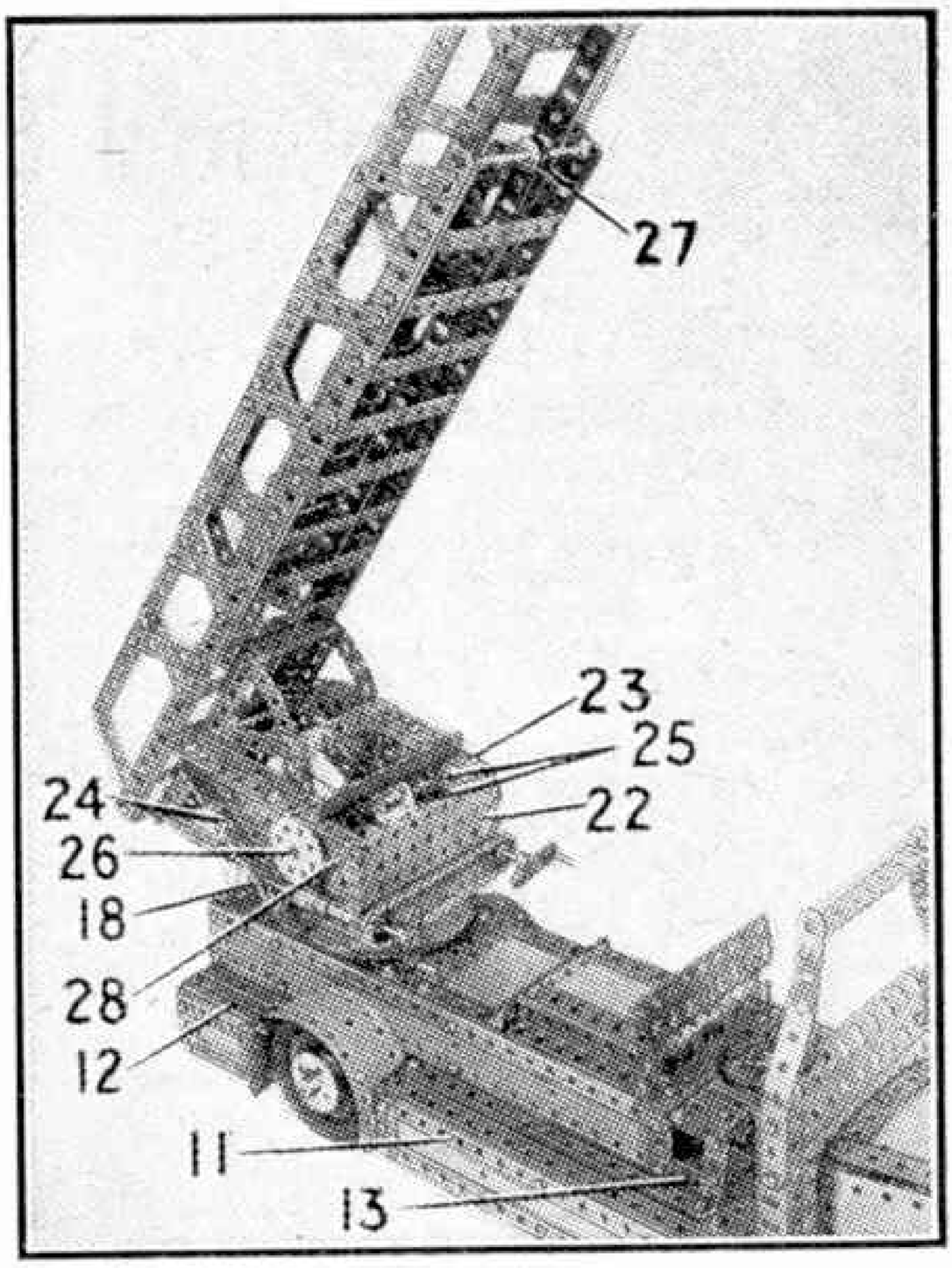


Fig. 4. Another view of the extended escape.

are connected by two 2½" × ½" Double Angle Strips, and Double Brackets are bolted to the Double Angle Strips as shown to guide the operating Chains. The escape platform pivots about a Rod passed through the end holes of Girders 23. A short length of Chain is tied at each side to the rear of the platform, passed through the Double Brackets and is tied between two Bush Wheels 25. These Wheels are fixed on a Rod mounted in the 2½" × 2½" Flat Plates, and a 57-tooth Gear 26 is fixed to each end of the Rod. The Gears are rotated by Worms on Rods mounted in Plate 22 and in Obtuse Angle Brackets bolted to Girders 24.

The fixed section of the escape consists of two rails, each made from two 18½" Angle Girders bolted together by their slotted holes, so that a gap is left between the short flanges sufficient to allow a third Angle Girder to slide freely. The sliding section is made from two 18½" Angle Girders connected by 2½" × ½" Double Angle Strips, and it slides freely between the gaps in the rails of the lower section.

Cord tied to the lower edge of the sliding section is passed round a ½" Pulley 27 and the pivot rod of the escape platform, and is attached to Rod 28.

Parts required to build model Fire Engine: 4 of No. 1; 2 of No. 1a; 5 of No. 2; 2 of No. 2a, 6 of No. 3; 6 of No. 4; 28 of No. 5; 16 of No. 6; 18 of No. 6a; 8 of No. 7a; 2 of No. 8; 4 of No. 8a; 2 of No. 8b; 10 of No. 9; 4 of No. 9a; 11 of No. 9b; 2 of No. 9c; 18 of No. 9d; 1 of No. 9f; 3 of No. 10; 7 of No. 11; 2 of No. 12; 6 of No. 12b; 4 of No. 12c; 2 of No. 14; 2 of No. 15; 2 of No. 15a; 3 of No. 15b; 1 of No. 16b; 3 of No. 17; 4 of No. 18a; 4 of No. 20; 6 of No. 20a; 3 of No. 20b; 1 of No. 23a; 7 of No. 24; 1 of No. 25; 3 of No. 26; 4 of No. 27a; 1 of No. 29; 3 of No. 32; 383 of No. 37; 2 of No. 37a; 87 of No. 38; 1 of No. 40; 1 of No. 44; 16 of No. 48a; 14 of No. 48b; 2 of No. 52a; 2 of No. 53a; 21 of No. 59 ;3 of No. 62; 2 of No. 62b; 5 of No. 63 1 of No. 70; 2 of No. 72; 1 of No. 73; 9 of No. 90; 1 of No. 94; 2 of No. 96a; 1 of No. 103; 2 of No. 103a; 3 of No. 103c; 2 of No. 103d; 2 of No. 103f; 2 of No. 111; 3 of No. 111a; 1 of No. 111c; 3 of No. 115; 2 of No. 125; 6 of No. 142a; 2 of No. 147b; 1 of No. 168a; 1 of No. 168b; 1 of No. 168c; 2 of No. 179; 1 of No. 185; 4 of No. 188; 17 of No. 189; 5 of No. 190a; 2 of No. 214; 1 E20R Electric Motor.

Club and Branch News

WITH THE SECRETARY

A HORNBY RAILWAY COMPANY RECORD

Early in April an application form for membership of the Hornby Railway Company was received from Graeme Eccles, Dunedin, New Zealand, who was duly enrolled as a member. My reason for drawing attention to this is that the official number of this new member is 200,000, so that his entry marks an interesting milestone in the history of the Company.

The formation of the H.R.C. was announced in the "*M.M.*" for October 1928, and the first member was actually enrolled during that month. The company was very successful from the start, for it offered wonderful opportunities for owners of Hornby Trains to obtain from its headquarter staff advice and information designed to make their hobby enjoyable, and the development of local Branches also contributed to this in a very notable degree.

In the years following its formation the Hornby Railway Company grew steadily, the advent of the Hornby-Dublo system in 1938 giving it increased impetus. The war checked its growth, as was to be expected, but when peace came the number of members increased rapidly and the first 100,000 was reached in August 1947. Then progress became phenomenal, and the next 100,000 members were enrolled in the comparatively short time of 3½ years.

Now for the third 100,000!

CLUB AND BRANCH ANNIVERSARIES

Meccano Clubs and H.R.C. Branches have their own celebrations. An interesting one that has just occurred is the 21st birthday of the Hornsea Meccano Club. This was founded on 11th March 1930 under the Leadership of Mr. R. W. Shooter, and its programmes have always been noteworthy for their variety and originality.

The Hornsea M.C. is the oldest continuously active Club in Great Britain, but away in South Africa there is a Club that this year will celebrate its 30th birthday. This is the Malvern (Johannesburg) M.C., founded in 1921 under the Leadership of Mr. R. P. Sykes. Perhaps the most noteworthy feature of the long career of the Club has been the readiness shown by officials and members to devote their energies to good works of all descriptions.

I am sure that all will join with me in congratulations to the officials and members of these splendid Clubs, and in wishes for even greater prosperity in the future.

PROPOSED CLUBS

FROGGATT—J. B. Oliveira, Oak Cottage, Hay Lane, Froggatt, nr. Sheffield.

BRAMHALL—M. Page, 66, Bridge Lane, Bramhall, Cheshire.

PROPOSED BRANCH

HARROW—L. Carson, 54, Capthorne Avenue, Harrow.

CLUB NOTES

CRYPT GRAMMAR SCHOOL (GLOUCESTER) M.C.—Subjects for recent Model-Building Contests have been Cranes and Armour. Both brought splendid entries, the chief prizes being awarded for a Breakdown Crane and an Articulated Tank Transformer respectively. Table Tennis continues and new members have been enrolled. Club roll: 36. *Secretary:* W. Jackson, 234, Stroud Road, Gloucester.

LLANDRINDOD WELLS M.C.—The Club Exhibition was a wonderful success, the attendance being 160. There was a good display of models and Hornby and Hornby-Dublo Trains also were operated. General work continues well, and there are more applicants for membership than the Club Room can accommodate. A gift of railway magazines and books has been made to the Club Library. Club roll: 21: *Secretary:* A. C. W. Carr, "Wynsbury," Middleton Street, Llandrindod Wells, Rads.

FOREST SCHOOL M.C.—Model-Building Competitions have been continued. Members show intense interest and visitors are often welcomed to the Club Room to see the results of their Model-building. A party of members accompanied Mr. A. R. Codrington, Leader,

Members of the Chinley Methodist Branch, No. 521. This Branch was incorporated in January 1950, with Mr. John G. Harris as Chairman and D. Fearnsworth, who is on the left of the back row in our photograph, as Secretary. Members carry out operations on a layout 10 ft. long and 4 ft. 6 in. wide, which is fitted on two boards to allow for rapid assembly on Track Nights.

on a visit to the Model Railway Exhibition in March. Club roll: 5. *Secretary:* D. C. Dunn, 64, London Road, Clacton-on-Sea, Essex.

BRANCH NEWS

RAMSEY C.P. SCHOOL (HANTS.)—More track has been added to the Branch layout and double track working is now in operation. In exciting speed contests various locomotives were given equal loads. A Branch Magazine is now produced. *Secretary:* P. Haddon, 2, Newtown Road, Ramsey, Hants.

REDDIFORD SCHOOL—Track Meetings continue with success and new members are being attracted. The Secretary gave a Lecture on "*Wheel Arrangements*" at one meeting. Others have been devoted to the construction of a model village, in which excellent use was made of match boxes, and to preparations for an Exhibition. *Secretary:* Robert Galley, 35, Field End Road, Eastcote, Pinner, Middlesex.

Train Assembly on Hornby Layouts

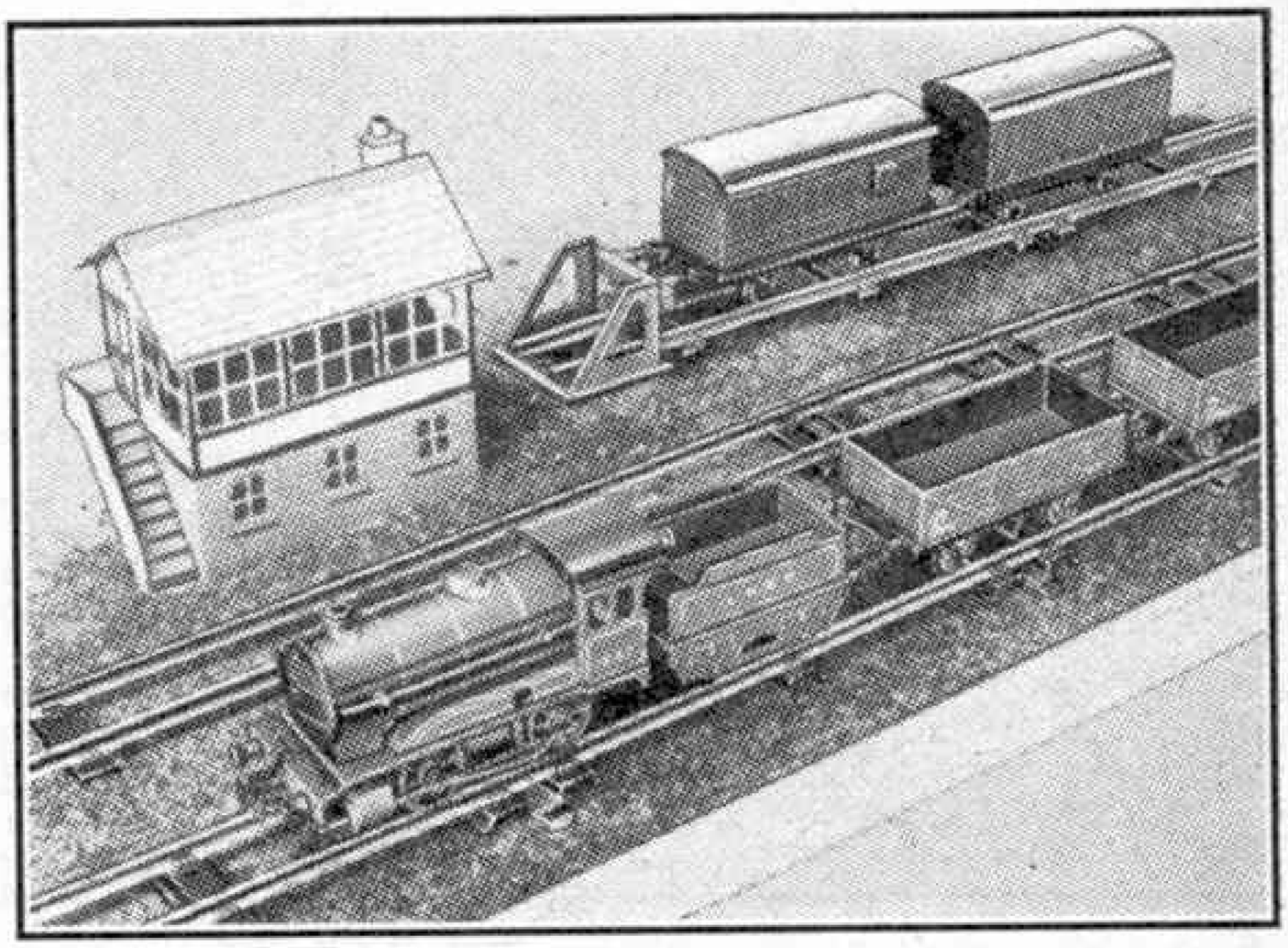
WHEN train operations are begun on a miniature layout a frequent practice is to put the engine on the track and then assemble the vehicles behind it. It is much more realistic, and therefore more interesting, to carry out the assembly of the train from vehicles already on the line and to run it "empty" to the station to take up its working. Running the train as a set of empties means that the engine must display the headlamp indication for this class of work. This involves one lamp on the centre bracket and one over the right-hand buffer as viewed from the cab of the engine.

Sometimes the engine that works the empty train to the station will take up the working of the service we have planned, and then its headlamps must be altered. If the train is to run as an express, there should be a headlamp over each buffer at the front of the engine; for a stopping train a single lamp in front of the chimney is required.

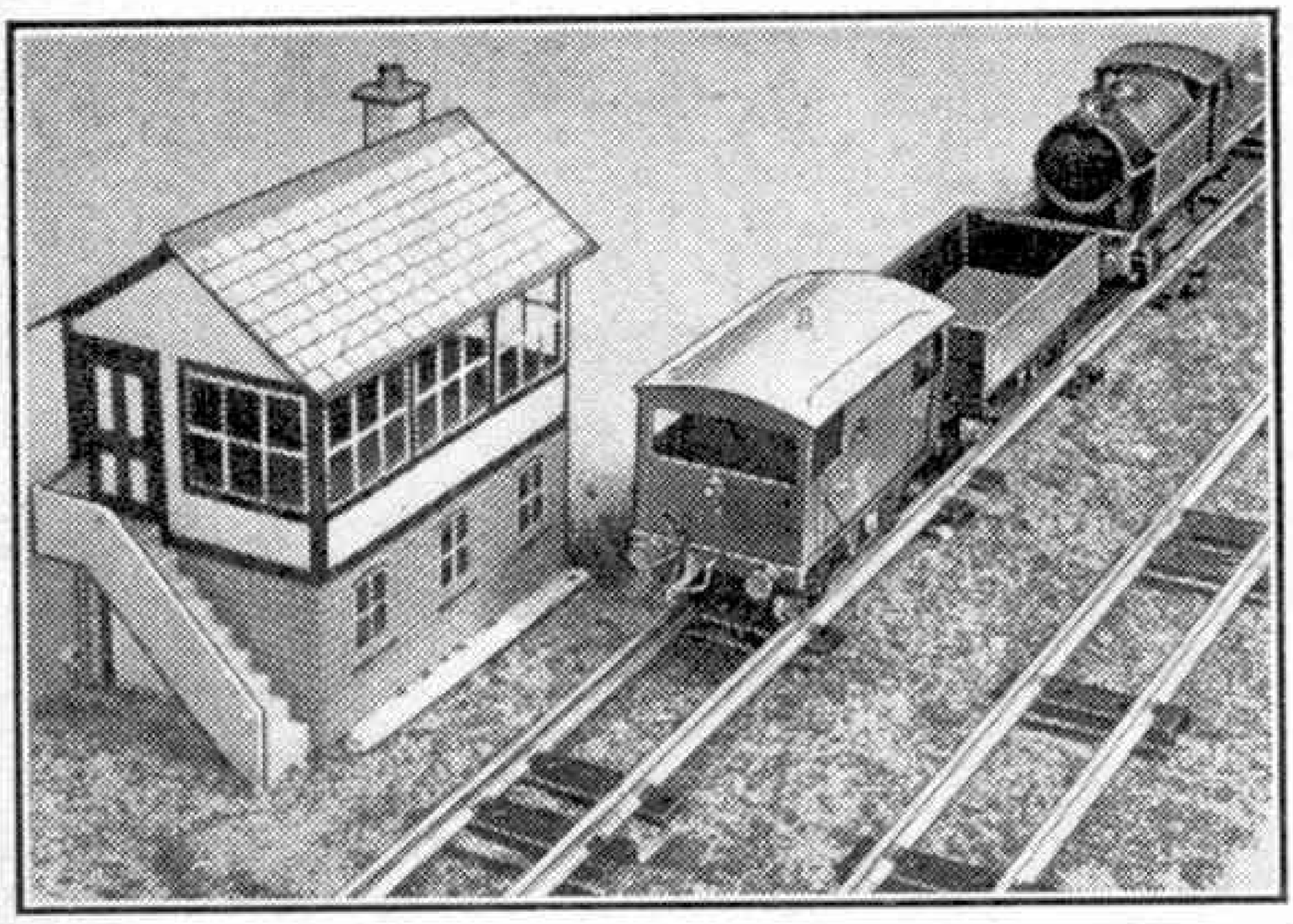
A point that should not be overlooked concerns the tail lamp on the train. If the engine has to run round the train at the end of its journey, the tail lamp must change ends too. These little details are sometimes neglected, but such practices are full of interest when correctly carried out.

The working of goods trains can be improved in a similar manner. Instead of simply putting the train together "by hand" it is much more fun to send off the engine to pick up the various wagons here and there on the layout until a train of reasonable length has been assembled. Even if all the goods vehicles on the system are accommodated in a single siding, the engine can make a succession of circuits round the main line, calling at the siding at intervals in order to pick up different vehicles. This kind of pick-up or "trip" working is a regular feature in actual practice, and its reproduction will be found good fun.

Unless a Goods Brake Van has come down the line with the engine from the start, it should be waiting with the first vehicles to be picked up, as these should not be run along the main line without a Brake Van. The tail lamp on the van should be in place and the sidelamps should be fitted to their brackets so that their red "glasses" face to the rear.



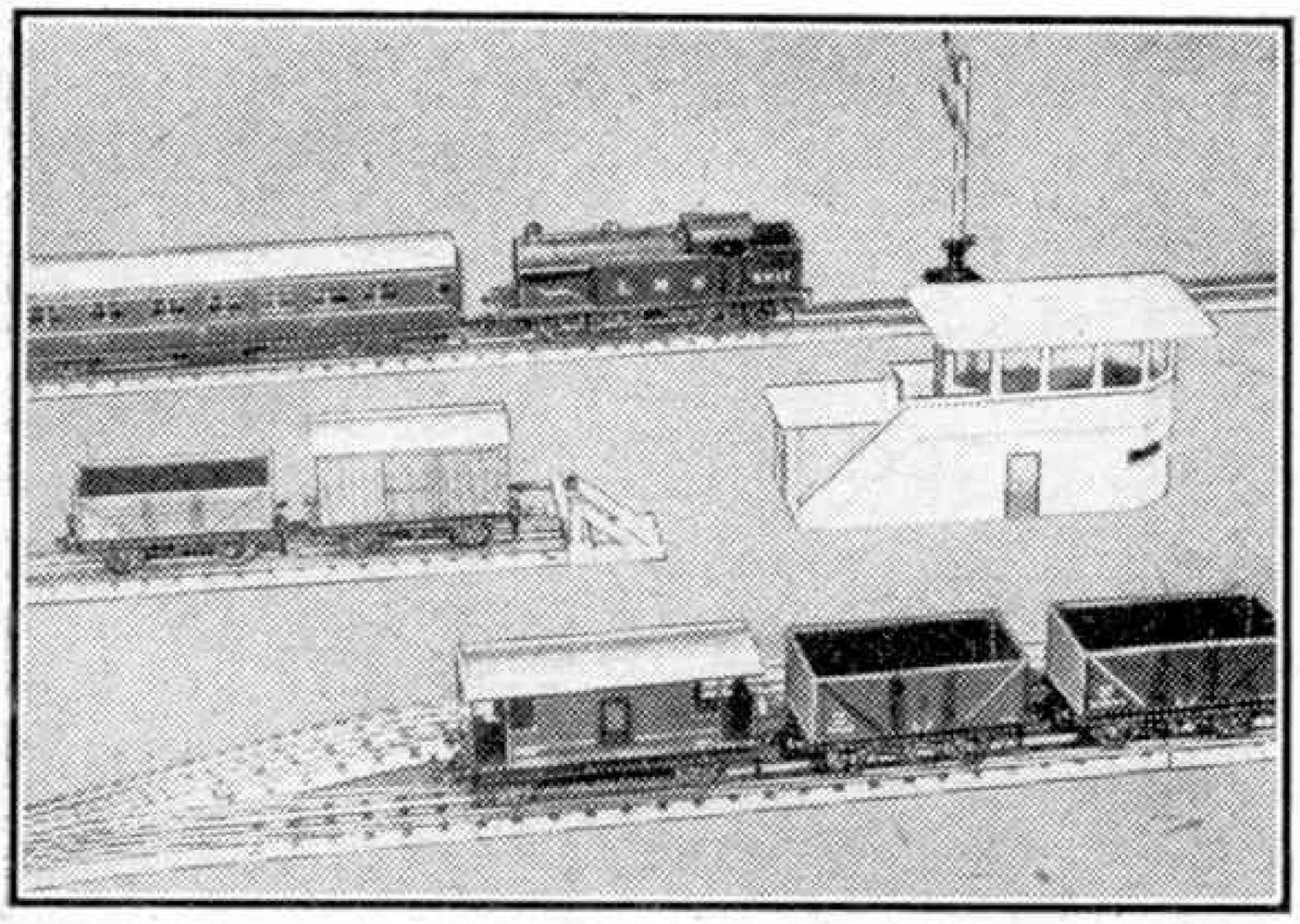
A through train of empties in charge of a Hornby No. 501 locomotive heading past the signal cabin. Note the two coaches standing in the siding in the background.



A pick-up goods train on its way down the line. The engine is a Hornby No. 101 Tank and the Brake Van is complete with tail and side lamps.

Loop Lines in Hornby-Dublo

ORDINARY sidings of the dead-end kind, that is terminated by Buffer Stops, are essential on any layout for shunting or for the storage of rolling stock. The plain siding taken straight off the main line has the disadvantage that a train cannot run directly into and out of it. A backing movement either on entering the siding or on leaving it is always necessary, according to the arrangement of the points leading to the siding.



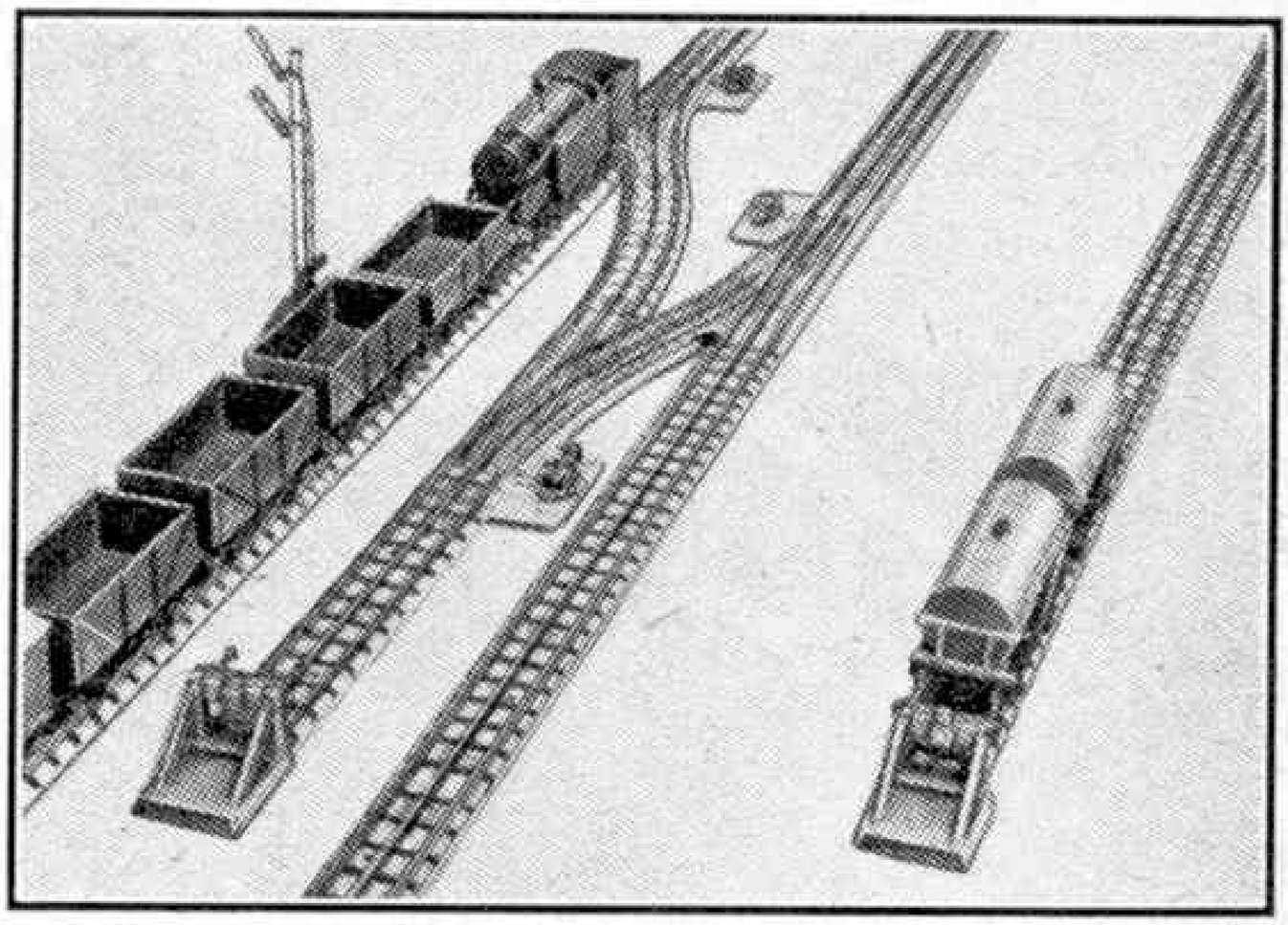
A local train in charge of a Hornby-Dublo 0-6-2 tank passes in the background. The loop lines and the dead-end siding near the signal cabin will be noted.

Although this type of working can be perfectly successful, it is more convenient to have points at each end of the siding instead of at one end only, and the dead-end siding thus develops into a loop line. The formation of a simple loop is quite straightforward. The facing points, either Right Hand or Left Hand, have connected to their curved branch a Curved Half Rail which brings the diverging line parallel to the main track. This is followed by as many straight rails as space allows. Then exactly the same arrangement in reverse leads the loop line back through trailing points into the main line again.

A loop of this kind thus involves two sets of Points, one L.H. and one R.H., and two Curved Half Rails. The number of Straight Rails will depend on the space available, but the straight part of the loop between the Curved Half Rails is always shorter by the length of one Straight Rail than the number of straights lying between the points on the main line.

With this arrangement a train that is to stand in the loop can run straight in over the facing points and then come to a stop in the loop itself. In layouts where more than one engine or train is available such loops usually incorporate Isolating Rails, so that each loop forms a separate section that can be isolated electrically. This makes it possible for an engine or train to be held there while another train passes on the main line.

Development of the simple loop by the use of additional points results in crossover points at each end of the loop forming the connection with the main line. This makes it possible to extend the loop beyond the points, the length of this extension depending on circumstances. Such extensions are terminated by Buffer Stops and are known as "spurs." They are useful when sidings leave the loop. An engine will not have to draw out on to the main line to complete shunting movements.

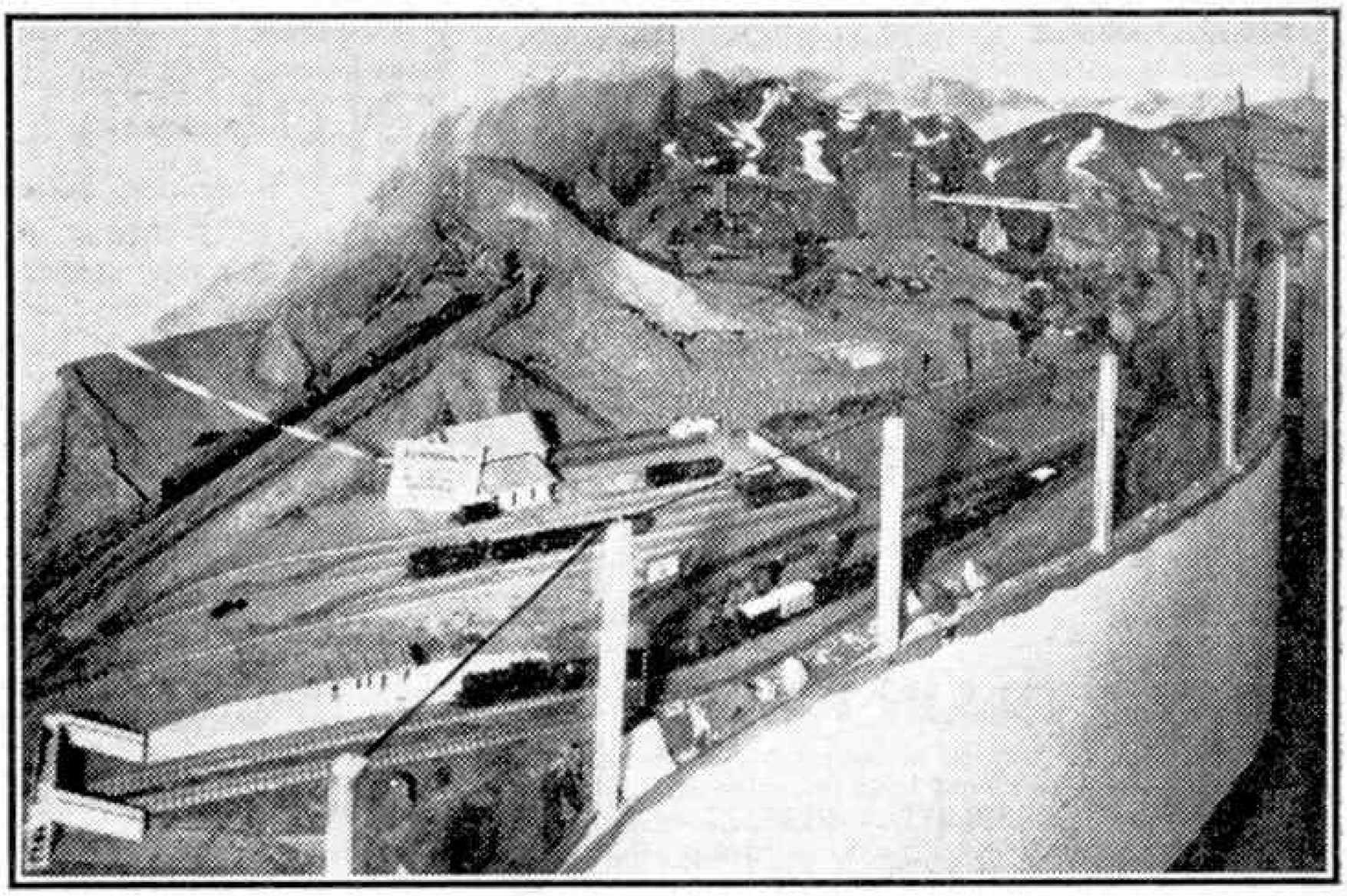


An interesting track layout showing a short engine line between two main tracks. Note the Tank Wagons in their siding.

A Hornby-Dublo Display in New Zealand

READERS will be interested in the Hornby-Dublo layout that formed an important part of the display of A. S. Paterson and Co. Ltd., at the Industries Fair held last year in Christchurch, New Zealand. The details and photograph on this page were supplied by Mr. R. H. Sherris, Manager of that firm's Christchurch branch, who is a very keen Hornby-Dublo enthusiast and was responsible for the exhibit as a whole.

The display was designed to give publicity to the Paterson activities in Christchurch, principally in the grain and seed business and in the wool trade, although various other interests were included. The idea behind the layout was to show how seed, sheepskins or other items are transported from the farms to the store to be processed for export. To provide rail transport a double track Hornby-Dublo main line traversed the whole of the exhibit, which covered an area of 28ft. by 12 ft. The ground plan could be described as following the "water wings" shape, the middle part being narrowed in considerably along one side, leaving two wings connected by this narrow section.



One end of the Hornby-Dublo display layout described on this page. The main line and sidings are seen against a realistic mountain background.

In one wing the countryside was modelled to imitate pasture land and farming country with a poultry farm in the middle of it. The other wing was arranged to give the effect of varying levels against the mountain background seen in the illustration. Thus, while the sidings serving this part of the country were level, the main line had to be carried across country by embankment and viaduct over low ground and by tunnelling through part of the mountain region.

The narrowed centre section of the layout was served by the principal station and opposite this were extensive works buildings in which the different Paterson processes were supposed to be carried on. Naturally these works were served by an extensive system of sidings taken directly off the main track. Along the lineside good use was made of Hornby-Dublo stations, signals, footbridges and other items where necessary, and the general effect of the layout was extremely realistic.

A train service was maintained on the main line more or less continuously for several hours at a time. Hornby-Dublo rolling stock was used, and the most numerous class of engine represented was the standard Hornby-Dublo Tank. Heavy work was carried out by a *"Duchess of Atholl"* which covered a distance of over 600 actual miles during the exhibition. In addition to the trains actually in motion, there were others used in the sidings simply for display purposes.

Adding to the busy effect of the railway system, provision was made for road traffic with Dinky Toys vehicles of various kinds. These were worked mechanically by an endless chain system arranged underneath the baseboard. Another feature, also arranged below the surface, was the use of several sound records of train effects and railway noises.

BARGAIN DISCOUNT APPROVALS!

We offer the largest and best selections in the business in our SUPER DISCOUNT APPROVALS, post free one way. You can have Br. Colonials or Br. Cols. and Foreign Mixed selections plus a grand book of sets. We welcome "wants" lists of single stamps (NOT Countries), and will include them without obligation if we can. Please note that we NEVER send again unless you ask.
For prompt, personal service, write to-day to—

THE BIRKDALE STAMP CO.
104, Liverpool Rd., Southport, Lancs.

PTS Postal Business Only

ROYAL FAMILY
COMMEMORATION PACKET FREE

The historical stamp portraying the Royal Family is included in this collection of different stamps covering 100 years of the House of Windsor, Old Victorian (1841), Duke of Windsor, King George V, Present King and Queen, Royal Princesses and Duke and Duchess of Gloucester. Sets of Canadian, Dutch and Argentine, scarce Bavarian, one from the Duke of Edinburgh's country, Greece, and European issues. Absolutely free. Just send 3d. postage and request our famous approvals.

LISBURN & TOWNSEND LTD. (MM)
94, BANKS ROAD — WEST KIRBY — WIRRAL

HALF PRICE APPROVALS

We are offering until further notice special books of GREAT BRITAIN, BRITISH COLONIALS, U.S.A. and AIRMAILS,

at 50% DISCOUNT

Minimum purchase, 10/- worth for 5/- net.
Send stamp for trial selection.

SAUNDERS & CO.
8, HEREFORD GARDENS, PINNER, MIDDLESEX

FREE! TRAIN PACKET

A fine lot of stamps showing old and new Locomotives, Railway Scenes, etc., Cat. up to 1/- each. **ABSOLUTELY FREE.** Just send 3½d. for postage and price list and ask to see our famous **"½d. UPWARDS"** approvals. *Write to-day to:*

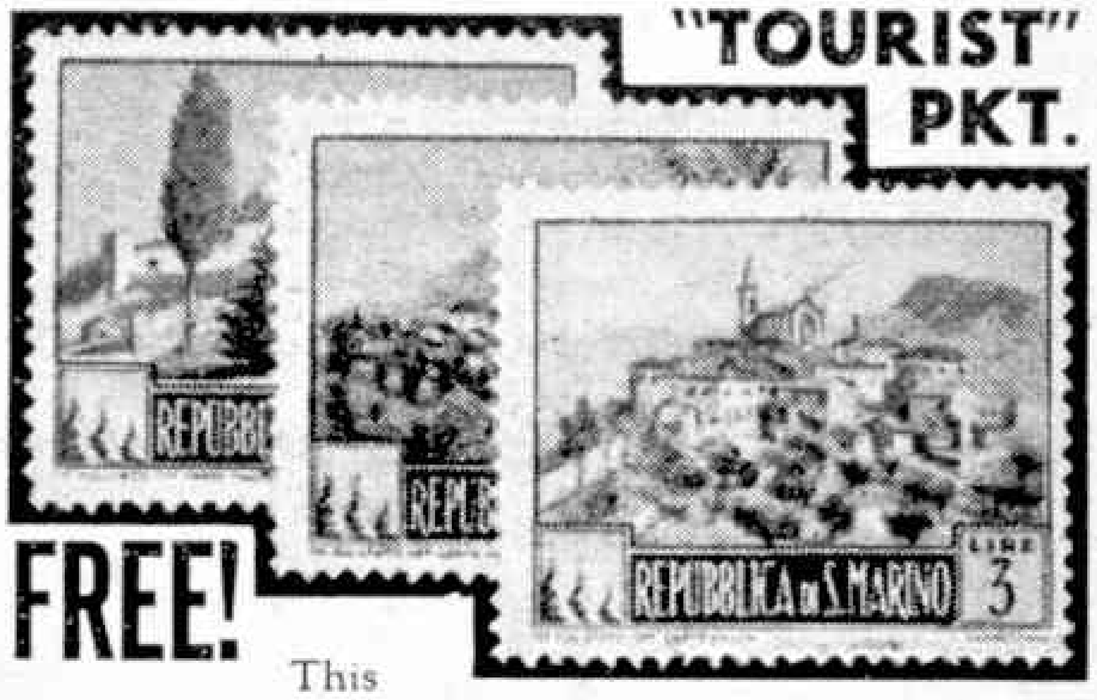
CAPT. M. CAMPBELL & CO. (Dept. MM)
58, High Street, Watford, Herts.

33 SUPERB STAMPS FREE

incl. pictorials from **BR. SOMALILAND** (surcharged), **SARAWAK, COMORE IS., RUANDA URUNDI, SAN MARINO, SIAM, CHINA.** Send 3d. postage, ask for approvals.
ROSTON (B), 106, St. Dunstan's Road, London W.6

Stamps Catalogued over 10/- FREE!

A really worth-while packet of **MINT PICTORIALS** and other attractive stamps—**ALL DIFFERENT**—will be sent to applicants for my latest Approvals and and Special Offers, who enclose 2½d. postage.
D. J. Palmer (M3), Highwood Hill Camp, Mill Hill, N.W.7



This grand set of **2-COLOUR PICTORIALS** (unused) and **10 other desirable stamps.** Just send 2½d. postage and ask to see Special **"Mercury"** Approvals.
Philip J. Dyke (P.T.S.), 35, Buckleigh Ave., London S.W.20

Read the
JUNIOR STAMP WORLD

The ONLY Magazine for the Young Stamp Collector

★ **Monthly .. .. .. Price 6d.** ★
EVERYTHING ABOUT YOUR STAMPS
Order Now from your Newsagent.

For specimen copies, send 6d. in stamps to:

JUNIOR STAMP WORLD
(M3), 161, WAVERTREE ROAD, LIVERPOOL 7 PTS

NYASALAND JUBILEE FREE!

This beautiful pictorial New Issue given **FREE** to all requesting **FINE APPROVALS** and enclosing 2½d. stamp.
G. D. LAMBERT, 8, Rowan Place, New Earswick, YORK.

GREAT BRITAIN

1841 Penny Imperf. 6d. 1870 Halfpenny Rose 4d. 1855/6 4d. Rose Cat. 10/- for 2/-. 1862 4d. Red Cat. 8/6 for 1/-. The four for 3/-. Selections on Approval.
HILLIER — 10, ARTHUR ROAD — MARGATE

FREE!!! **CONTINENTAL STAMPS**
Postage, etc. 4d.
J. THOMPSON, 42, BOURNEMOUTH RD., BLACKPOOL

FREE — PACKET CURRENT BRITISH COLONIALS
To Approval Applicants enclosing 2½d. postage.
L. G. HAYWARD, 3, Canute Road, Hastings, Sussex

FREE 100 Stamps, Catalogue Value approx. 10/-, to genuine Approval Applicants. Enclose 3d. please. **STAMPS (2B), 19, Holloway Street, Minehead, Somerset**

FREE! THIS FINE SET
& Large New INDIA (PORTRAYING 2 LARGE ELEPHANTS)

To collectors asking to see my **Amazing** Approvals. Send 3d. for my postage and lists. You may join **"THE CODE STAMP CLUB."** Sub. 1/-. You receive **Badge,** Membership Card with list of **fine Gifts,** inc. **Magnifying Glass, etc.** and Approvals monthly. — **WRIGHT'S STAMP SHOP — M20 — CANTERBURY — Kent**

For other Stamp Advertisements see also pages 282 and xvi.

Stamp Collecting

The New India

By F. Riley, B.Sc.

IN the last two issues of the "*M.M.*" the stamp histories of the new Asiatic Dominions, Ceylon and Pakistan, were briefly reviewed. Now we come to the third, India, which attained independence as a Dominion of the British Commonwealth in 1947, and was declared a republic in January of last year.

Both of these great events were celebrated by stamp issues. In the independence set, one of three stamps, the national flag of India was seen in its original colours, orange-red, white and saffron stripes, on the intermediate value, 3½ a. The lowest value of the set illustrated an Asokan capital, the head of a column dating from the reign of Asoka, the great Indian Emperor of the third century B.C. The highest value of 12 a. pictured a modern aircraft, and was intended for airmail purposes.

A special folder produced for this set gave details of the first official air mail flight undertaken in India, which is claimed as the first of its kind in the world. The flight was made on 18th February 1911, when 6,500 letters and postcards were carried from an Exhibition in Allahabad to Naini Junction by M. Pequet, a French airman.

The further step taken by India in January 1950 was made the occasion of the issue of a set of four stamps, two of which are illustrated on this page. The designs are simple. In each a boy and girl are seen looking into the future, and the remaining parts of the design illustrate important features of India life. On the 2 a. stamp, illustrated here, crowds are seen celebrating India's new and full independence. On the 3½ a. value a quill, inkwell and leaflets are seen, the leaflets being inscribed with a favourite hymn of Mahatma Gandhi. The 4 a. stamp, seen at the foot of the page, emphasises the importance of agriculture to India, and the remaining stamp, 12 a. in value, with its spinning wheel and cloth, serves a similar purpose in connection with India's cottage spinning industry, which was so greatly encouraged by Gandhi.

Between these issues came several commemoratives. These included another stamp with a picture of an aircraft, issued in 1948 to mark the inauguration of the air service between India and Great Britain; four stamps, bearing portraits of Gandhi, that celebrated the first anniversary of independence; and the four U. P. U. stamps of 1949, all of the same design, illustrating the globe and the Asokan capital already seen on the 1½ a. value of the independence set.

In addition there was the long and intensely interesting archæological series produced in 1949, which was the new India's first definitive issue. In this there are 16 stamps, in various colours.

I illustrated five of the splendid stamps of this set in November 1949 and this month I reproduce four further examples. Of these the 6 p. value shows one of two large representations of war horses in the grounds of the Sun Temple at Konarak in Orissa. This temple was built about 700 years ago, and to-day is in ruins.

The 1 a. value, which pictures a statue now in the Lucknow Museum, is of special interest in that it is an example of an error of design. The stamp shows the figure with its left hand on its left knee, but the statue has the right hand on the right knee. When the error was realised a new printing was made with the figure in its correct attitude.

The 6 a. stamp shows the tomb at Bijapur of Muhammad Adil Shah, which has one of the largest domes in the world: the diameter of this is 144 ft., and it covers over 18,000 square feet. The last of these stamps illustrated is the 1 r. value, which shows the famous Victory Tower of Chittorgarh, a structure of nine stories 120 ft. in height. It was built just over 500 years ago to commemorate the victory of a Hindu ruler over Mohammedan enemies.

This archæological set is a handsome one, with very interesting designs in various pleasing colours. Apparently it is now regarded as unsuitable for general use and, as Mr. Metcalfe points out in "*Stamp Gossip*" of this issue, it is shortly to be replaced by a new set. I suppose that by this time most collectors have been able to get examples of the stamps, but if not they should certainly try to acquire the set, which will provide a really attractive page for their albums.

This does not quite complete the story of India's stamps since attaining independence, for two other issues have appeared. One, showing two extinct creatures of the elephant tribe, was reproduced in "*Stamp Gossip*" for April last. The other celebrates the first Asian Games, held this year in India, and one value is reproduced in this month's "*Stamp Gossip*."

NATIVE GODDESS FREE

ABSOLUTELY FREE. Write to the **Windsor Stamp Co.** for this fine interesting New Issue from the **FRENCH INDIAN SETTLEMENTS** which depicts **Hindu Goddess Apsara.** They will send it **to you ABSOLUTELY FREE** to improve and add value to your very own collection. In addition, they will also send **FREE TO YOU** obsolete **DENMARK** (King Christian), handsome **HUNGARY** (Saint Stephen) and fascinating **FRANCE** (Greek Goddess Iris).

SEND NOW before you forget and miss this grand opportunity. Just write for **Native Goddess Packet Free** and a **Selection of Windsor Stamps on Approval.** Send 3d. stamps to cover posting costs to you.

WINDSOR STAMP CO. (Dept. M), UCKFIELD, SUSSEX

FREE!

TO ALL COLLECTORS

4 STAMPS OF GOLD COAST

BARGAIN - 50 CHINA 1/3

Send 2½d. Postage.

G. P. KEEF — WILLINGDON — EASTBOURNE

CAYMAN ISLANDS UNUSED SET FREE!

A splendid offer to all stamp collectors of the new Cayman Islands stamps in fine two-colour designs showing a Cat Boat at sea, a beautiful Coconut Grove, and a most interesting picture of a Green Turtle (the kind that is made into soup!).

Free to all asking to see my approvals enclosing postage.

R. D. HARRISON, ROYDON, WARE

FREE GIFT OF STAMPS

to every applicant for approval books. The GIFT contains 30 British Colonials including 8 K.G. VI mint—no Great Britain. Good discount is given and a list of 98 Gifts is sent. These can be chosen by you and vary in value according to the money sent for purchases. They include K.G. VI; Silver Jubilees; ALL the Colonial Victory sets mint; and Foreign stamps. 3d. postage please.

C. A. RUSH, 38, Queen's Avenue, Whetstone, London N.20

FREE DUPLICATE EXCHANGE!

Why have "twicers" when you can exchange them for others FREE? Details with 5 large size GOLD COAST—including the famous "TALKING DRUMS," 2d. Fictorial—FREE. JUST REQUEST Approvals and enclose postage. Dealers supplied. Overseas Agents wanted. Price list free.

ASTLEY & CO. (M)
103, CADMAN CRESCENT, WOLVERHAMPTON

N.Z. Triangular Pkt.

including **1943 HEALTH** (illustrated), **Coronation, Jubilee, PEACE,** Commemoratives, etc. **ABSOLUTELY FREE** to all requesting our pictorial approvals and enclosing 2½d. postage.

BRIDGNORTH STAMP CO., (M.11), BRIDGNORTH

100 DIFFERENT STAMPS FREE

(including TRIANGULAR and PICTORIALS)

To Approval Applicants enclosing 2½d. postage.

N. JOHNSON (Dept. M.M.), 19, Hillside, Slough, Bucks.

TOKELAU ISLANDS Complete Pictorial Mint Set **FREE.** Enclose 2½d., request approvals.

WATSON, 85, Larkswood Road, Chingford, London E.4

FREE 25 Used BRITISH STAMPS From VICTORIA to GEORGE VI **FREE**

This fine collection of BRITISH stamps sent FREE to all applicants who send 2½d. for postage and ask to see a selection of my "WORTH WHILE" approval sheets. No stamps sent abroad.

Jos. H. Gaze, 10, Pimlico Road, CLITHEROE, Lancs.

BARBADOS (New Issue)

of W. Indies University Set, this stamp of the **already scarce** issue, will be given **Free** to all **asking for** our approvals and enclosing **3d. stamp.**

FRANCIS CURTIS LTD.
(Dept. M.Z.)
226, BAKER ST., LONDON N.W.1

PICTORIAL APPROVALS

All the latest and most attractive stamps, including brilliant mint Pictorials of all the Crown Colonies—Coronations, Victories, Silver Wedding, etc.—sent post free one way, immediately on receipt of your application, on 10 days approval. Good discount.

G. E. MOAT
514, Fairfax Drive, Westcliff, Essex

KINGS OF SPEED PACKET FREE

This Packet includes **Fast Cars, Locomotives** and Record-breaking **Airliners,** etc. and is Absolutely Free. Simply request my Discount Approvals and enclose 2½d. stamp. **John H. Abel (M.1.), 3, Alder Close, Sturminster Newton, Dorset**

BRITISH STAMPS ON PAPER WORTH SORTING. 1 lb. 2/9, 2 lbs. 5/-, Br. Emp. ¼ lb. 6/6, World ¼ lb. 5/-. Lists Free. **A. Davies, P.T.S., 111, Holme Lacy Road, HEREFORD**

FREE. 20 Scandinavia incl. pictorials, commemoratives and centenary. Send 2½d. for bargain discount approvals. **WALKER, 13, BROOM RD., HALE, CHESHIRE**

FREE—STAMPS CATALOGUED 5/-
to applicants for ½d. approvals
COX, 17, STONELEIGH PARK ROAD, EWELL

For other Stamp Advertisements see also pages 280 and xvi.

Stamp Gossip

and Notes on New Issues

By F. E. Metcalfe

THERE has always been something that the writer of these notes cannot understand, and that is the relative unpopularity of the stamps of those far away countries in the South Seas. The stamps are attractive enough, and what could be more romantic than the countries themselves? Yet if collectors at home are going to leave out of their collections any Commonwealth issues, the ones rejected are the stamps from Cook Islands, Niue, Tonga, etc. Can the reason be that these countries are too far away, or is it because they have not produced many stamps? If the latter is the reason, then one of these countries may become popular, for within the last few months Tonga has actually produced two commemorative issues, which is as many as it had hitherto issued during the whole of its philatelic history. What is more, this latest set is quite attractive.

The designs can hardly be considered of a high artistic level, but they are bright and well printed, and as they will have a life of only three months, collectors will be wise to get their sets whilst they are still current. As it is possible that this issue may be the turning point in the popularity of the stamps of Tonga, it might be wise to buy also the penultimate commemorative set, which is still obtainable at very little over face value.

This latest set commemorates the 50th anniversary of the treaty of friendship between Great Britain and Tonga. Bradbury, Wilkinson and Co. Ltd. were the printers, and there are six values in all, the top being of 1/–. Decidedly a set to acquire.

Our top illustration is a new departure. Instead of being a postage stamp, it is actually a postage due label, as these things are known officially, though the only real difference between the two is that the recipient of the letter pays for the stamp instead of the sender. Hitherto postage dues have not been particularly popular with the average collector, for until recently they were generally much more difficult to obtain than ordinary postage stamps. But all that is changing, and now dealers can obtain new postage due issues from the Crown Agents in London in the same way as they can buy postage stamps. The stamp illustrated, one of a set of eight was issued on 1st March for the Seychelles Islands. It seems rather strange that this colony should have gone so long without these things and then should need eight different values. Perhaps the answer is that the authorities realise the growing interest among collectors.

Another country, Nyasaland, brought out a set of four postage due stamps last year, on 1st July, but no announcement was made at the time, and neither dealers nor collectors knew anything about it until a new printing of the 1d. was mentioned by the Crown Agents. This caused everybody to look round. Actually the set concerned, which is not in the catalogue for the reason given, has the values 1d., 2d., 3d. and 4d.

There is talk of an entirely new set of stamps for India. Apparently the archæological set has not proved as popular as was expected. The designs are of extreme interest when studied carefully, but unfortunately they are all a bit too complex to show up well on such a small surface as a postage stamp. Nevertheless collectors should try to get a set together, for they are well worth having. Most values can be obtained quite cheaply in a used state, but care should be taken not to get heavily cancelled copies, otherwise the beautiful designs cannot be studied. In the meanwhile India has released two commemorative stamps to mark the holding of the 1st Asian Games in India. As our illustration shows, these stamps are quite handsome.

Our third illustration is a surcharged stamp from the Somaliland Protectorate, which is part of a set that was announced about a year ago. Last year the Crown Agents mentioned in their bulletin that Aden, Aden States and Somaliland would have their stamps surcharged with cents and shillings, so that they would be in line with the change of currency of these protectorates. The East African currency which has been adopted is simplicity itself, 100 cents making one shilling. The point for collectors is that some of these stamps will have a very short life, as other values will be surcharged when the small stocks are used up. So if you have 12/–, the sum a full set will cost, and you want the set for your collection, buy it at once; you may have to pay a good deal more when it goes obsolete.

The remaining illustration this month is a commemorative from Egypt, a stamp issued to mark the holding of the Cotton Congress in Cairo. This is of an attractive olive shade, and the design is well up to the usual high standard associated with modern Egyptian stamps. Few countries were more popular with British collectors than Egypt, and then Gibbons removed its stamps from the K.G. VI portion of their catalogue, so that for a time collectors did not know in which part of the catalogue to find them. Unfortunately the section where they actually are now costs 17/6d., and this is a serious obstacle to their collection. With rising paper costs a cheaper catalogue is not likely at present.

And now for a tip. Last year the current 2c. of British Honduras was found perforated 12, instead of the usual $11\frac{1}{2} \times 11\frac{1}{2}$, and copies were obtainable at about 6d. Gradually this price has been increased until now about three times as much as that has to be paid. But if you need that stamp for your collection, don't hesitate to pay up to two shillings, or even half a crown, if necessary, for one day a copy will cost at least twice as much.

From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

RELICS FROM THE DAYS OF SAIL

Readers of the "*M.M.*" who have spent a holiday at Broadstairs may have noticed the building at the landward end of the small jetty and have wondered at the story behind the ships' figureheads mounted on it. These are shown in the accompanying photograph.

An interesting building at Broadstairs, Kent, on which are mounted two ships' figureheads. Photograph by N. Dyer, Kenton.

The building is about a century old. The portion on which the figureheads are is known as the boathouse, while the lower portion to the right, from which there is a fine view seaward, is called the Lookout Loft.

Coming to the figureheads themselves, that of the Scotsman to the left is from a Scottish brig, the "*General Cluny*," which went aground on the notorious Goodwin Sands about 100 years ago. These sands, some seven miles south-east of Broadstairs, are about 10 miles in length and four to five miles from the shore. They are partially exposed at low tide, and have been the graveyard of innumerable ships through the centuries. They still claim victims in spite of the four lightships that mark them. The navigable channel between the Goodwins and the English coast is the well-known roadstead known as the Downs.

The second figurehead represents the god Hercules; it was taken from an Italian barque that went ashore on the Brake Sands, off nearby Margate, some 90 years ago. Above it are two rib bones from a whale that was washed ashore at adjoining Kingsgate at about the same time. According to local legend, the roar of the stranded whale could be heard over a mile away! It is interesting to note in passing that the stranding of whales, seals and similar creatures usually associated with colder climates is not so uncommon in British waters, for several cases having been reported quite recently.

N. Dyer (Kenton).

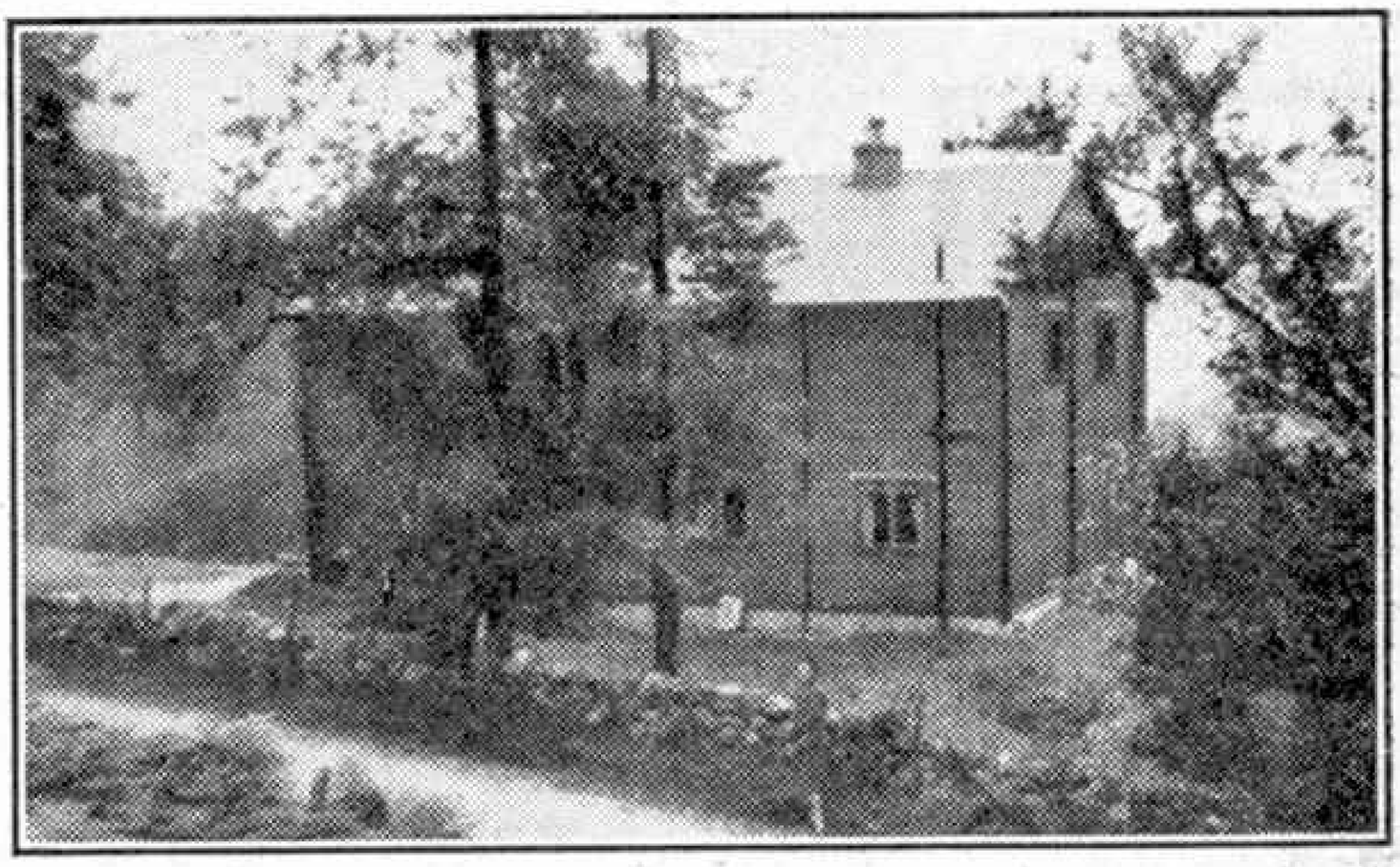
BUILT IN NORWAY

Since the appearance in the "*M.M.*" of November 1942 of my photograph of "Lakeland's Norwegian House" I have discovered two more buildings in Britain that were actually built in Norway, shipped across the North Sea, and re-erected here. These are the Scottish Youth Hostels at Glen Nevis, near Fort William, and in Glencoe. I have stayed at each of these for a few days, and I can vouch that they are very substantially built.

The Glen Nevis hostel is in the heart of the glen, and from it one has wonderful views of the great cliffs of Ben Nevis, Britain's highest mountain, 4,406 ft. in height. The Glencoe hostel, of which I enclose a photograph, is in an equally fine setting, with Bidean nam Bian, 3,766 ft., the highest peak in Argyllshire, in full view; but perhaps it is even more interesting to know that the hostel stands in the area where the terrible Massacre of Glencoe took place in 1692. In fact, the only living relic of the massacre is just a bit down the glen from the hostel. It is a very old, gnarled hawthorn bush, at least 300 years old, in the shade of which one of the soldiers of Argyll's Regiment was buried. This venerable tree is carefully protected by the owner of the glen.

The establishment of both hostels was made possible by the strenuous effort of Scottish hostellers and, I believe, a grant from King George's Jubilee Trust. In any case the hostel authorities were wise in deciding on Norwegian buildings, for both fit the Scandinavian-like scenery of the West Highlands perfectly

C. R. Rowson (Liverpool).

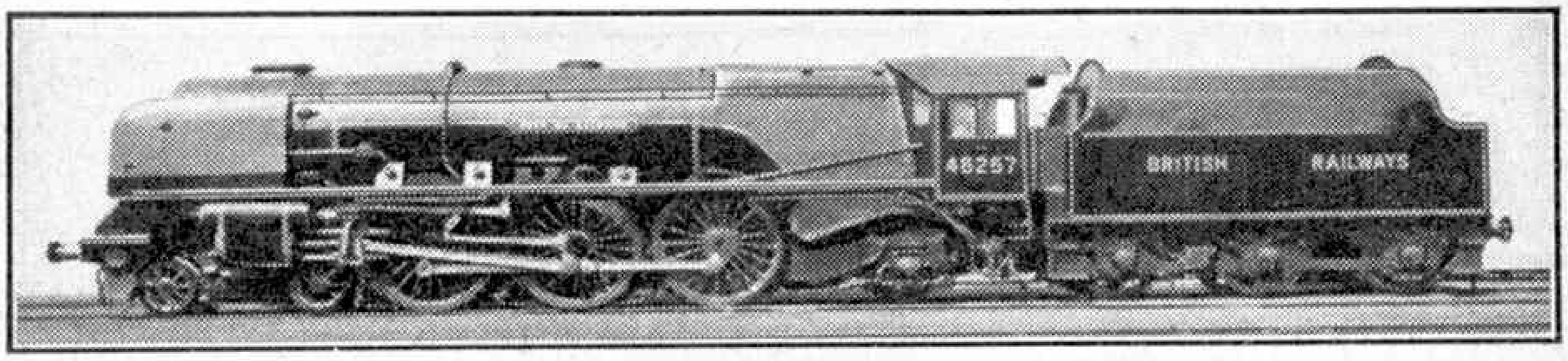


The Scottish Youth Hostel in Glencoe, which was built in Norway and re-erected in Scotland. Photograph by C. R. Rowson, Liverpool.

Competitions! Open To All Readers

Prize-winning entries in "M.M." competitions become the property of Meccano Ltd. Unsuccessful entries in photographic, drawing and similar contests will be returned if suitable stamped addressed envelopes or wrappers are enclosed with them.

Do You Recognise These Locomotive Classes?



After a recent railway tour a member of the "*M.M.*" staff described some of the engines he had noted, and asked us to tell him which classes they represented, and the former companies to which they belonged. We soon worked out the answers for him. Can you do this? We give an illustration of the first engine to help you.

Here are the clues he gave us:

1. "Pacific" express engine with double chimney and smoke deflectors, running plates cut away at the front end and no footsteps to the cab.
2. Freight engine, 0–8–0 of unusual design, with prominent splashers and sand boxes, and a sparse cab typical of all big engines of its original parent company.
3. A six-coupled express engine, with a very small chimney and dome, a fire-box that appears to slope at the top and smoke deflectors. The exhaust from this engine is very rapid.
4. Neat little tank engine with tall chimney, outside cylinders, single slide-bar and a long cab extending over the coal bunker.
5. A four-coupled engine, rather small, with continuous high splasher and small flat-roofed cab with large, round front spectacle glasses; frames cut away over the coupled wheels.
6. Eight-coupled engine of unusual appearance, with solid leading wheels, safety valves close to the dome, and smoke-box of smaller diameter than the boiler.
7. Six-coupled engine with high footplating and prominent splashers with brass nameplates. No side windows to the cab, which is very high up, as the footplating is not dropped at the cab end of the engine.
8. Weird-looking goods engine, with no splashers, wheels of a type uncommon in Britain, and chimney and dome also of unusual appearance.

As usual, the competition will be divided into two sections, for Home and Overseas readers respectively, and in each section there will be prizes of 21/–, 15/– and 10/6 for the best entries in order of merit. Consolation prizes will be awarded for other deserving efforts. If there is a tie for any prize, neatness and general appearance will be taken into account.

Entries should be addressed "*June Locomotive Contest, Meccano Magazine, Binns Road, Liverpool 13.*" Closing Dates: Home Section, 31st July; Overseas Section, 31st October.

A Novel Drawing Contest

In this competition we ask readers to make a copy of any illustration in this issue of the "*M.M.*" The drawings should be in ink or pencil.

There will be four sections altogether, two for Home readers and two for those Overseas. In each case there will be Senior and Junior Sections, for readers of 15 years or more and for those under 15.

In each section there will be prizes of 21/–, 15/– and 10/6 for the best entries in order of merit, with Consolation Prizes for other good efforts. Closing Dates: Home Section, 31st July; Overseas Section, 31st October.

June Photographic Contest

The sixth of our 1951 series of photographic contests is a general one, in which we invite readers to send in prints of any subject. The photograph must have been taken by the competitor and on the back must be stated exactly what the photograph represents.

There will be two sections, A for readers aged 16 and over, and B for those under 16. There will be separate Overseas Sections, and in each section prizes of 21/–, 15/– and 10/6 will be awarded. Entries should be addressed "*June Photo Contest, Meccano Magazine, Binns Road, Liverpool 13.*" Closing Dates: Home, 30th June; Overseas, 29th September.

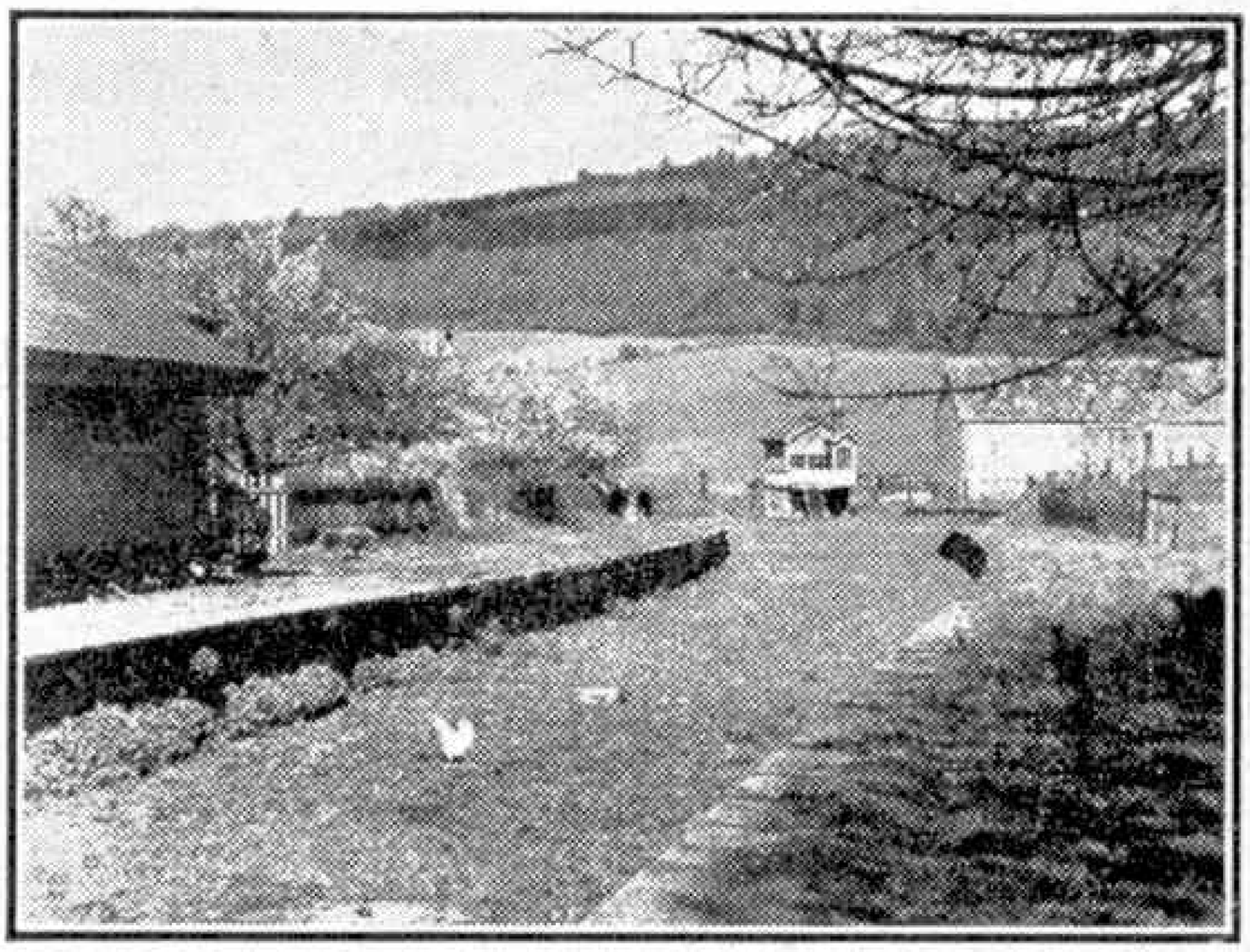
Belfast to Cork by "Enterprise"—

(*Continued from page 243*)

Boyne Valley and over the 90 ft. high viaduct into Drogheda. The 31-odd miles from Drogheda to Dublin follow the coast fairly closely.

To facilitate Customs examination, the train is brought into No. 3 platform at Amiens Street Station instead of direct to the C.I.E. side. On arrival the G.N. engine is detached, and the C.I.E. representative backs on to the other end of the train about five minutes before starting time. At 1.30, southbound passengers having boarded, the train is drawn out of No. 3 platform, reversed over the crossovers to the C.I.E. departure platform, and then right away ahead over the connecting lines via North Strand Road Junction, as shown on the diagram, to join the main C.I.E. line at Island Bridge Junction. The old Midland Great Western lines to North Wall and to the former Broadstone terminus respectively are passed under near Liffey Junction, the Broadstone line here being closely paralleled by the Royal Canal.

Phoenix Park tunnel is negotiated, the River Liffey is crossed, and the line curves round to Island Bridge Junction. Here it falls in with the former Great Southern main line climbing out from Kingsbridge past Inchicore to Clondalkin. Thence the route undulates, practically all the way to Limerick Junction, where as a result of the peculiar layout crossing over and reversing into the platform is necessary. More undulations follow; the line drops to Mallow Viaduct and rises past Mourne Abbey; and then falls, steeply over the last stage, and down through the tunnel into Cork.



A station without a railway. Newland, in the Forest of Dean, was closed during the first World War and its track removed for war purposes. Station offices now serve as a farm house and the only "traffic" on the right of way, hens, geese and turkeys, does not require supervision from the still-surviving signal box. Photograph by Reece Winstone, A.I.B.P., A.R.P.S.

A Real Flying Motor Car—

(*Continued from page 249*)

cure her because it cost dollars, happened to have some with him and donated it anonymously through the newspaper. The "Airphibian" delivered the drug by flying it to Wolverhampton and, after shedding tail, wings and propeller there, driving the last 20 miles to Stafford in record time.

Since then, back in the States, the prototype "Airphibian" and its sister 'planes have been flown through snow, rain, sleet and sun, to air shows, state fairs, business appointments, shopping, selling and on straightforward pleasure trips. They have been over the Appalachian mountains and through tunnels under the Hudson and other rivers, always under their own power.

The first production "Airphibians" are now being completed in Fulton's Continental Company works at Danbury, Connecticut. Their owners will have to be prepared to answer a lot of questions and one can only wish them better luck than the reporter who tried to describe the "Airphibian" to an elderly lady, only to be brushed aside by her husband who had been standing silently near. "You should be ashamed of yourself, young man," he said, "pulling an old woman's leg like that. I'm quite prepared to believe in Flying Saucers; but Flying Motor Cars . . . . . .! Have you no respect for your elders?"

Wings for Tomorrow—(*Continued from page 260*)

played in the intense war against the U-boats, and the account of their achievements makes fine reading. The "Empire" boats of B.O.A.C. also had some lively adventures, as the changing fortunes of war caused established air routes to be abandoned and new ones brought into use.

After the war B.O.A.C.'s new policy of superseding their flying boats by landplanes gradually came into effect, first one class of flying boat and then another being withdrawn until all were out of service. But in 1947, Saunders Roe Ltd., of Cowes, began the construction of the first of three giant 140-ton "Princess" flying boats, which had been designed with an eye to super-luxury service on the North Atlantic route. In this news flying boat enthusiasts hoped they saw the beginning of a more moderate policy in official quarters, but this hope has been dashed by the recent announcement that the completed boats will be handed over to the R.A.F., as reported in our "*Air News*" pages this month.

In two special chapters the authors analyse the merits of the flying boat and seek to prove that in both the commercial and military aviation fields the advantages of this form of aircraft have not been fully appreciated, nor its possible uses entirely explored. A detailed chronological list of types of flying boats built since 1905, and just over 50 excellent photographs of some of these types, supplement the text.

Chinese Trains were Different—(*Cont. from page 267*)

in the long blue gown seated in the opposite corner was himself a robber, with an automatic or two concealed in his padded sleeves. It never paid to look as if you were worth robbing when you were aboard the Smugglers' Train.

Such were the railways of China's recent yesterday. They were then, and are to-day, thin but vital threads crossing the great mass of Eastern Asia. Tremendous capital development is needed; rolling stock needs replacement; existing lines require extension. For instance, that hundred miles of track linking Kunming with Kutsing was intended to stretch as far as Suifu, on the River Yangtse. One day it will; and the engineers and coolie labourers who make this and similar achievements possible will usher in a new era of railway development in China.

BACK NUMBERS OF THE "M.M."

Copies of each of the following issues, price 11d. each, are still available: February, May, June, July, August, September, November and December 1950, together with all previous issues of this year.

Readers wishing to obtain copies of these issues should write immediately to the Editor, "Meccano Magazine," Binns Road, Liverpool 13, enclosing a Postal Order.

Fireside Fun

Testy Customer: "This jar looks dusty. Is the jam new?"

Shocked Grocer: "Of course, madam. We never sell it second-hand."

* * * *

"Don't pull faces at him, Tony."
"Well, he started it."

* * * *

"With all the medals I have won on the football field I could nearly start a jeweller's shop."

"And if you had all the ducks you got at cricket you could start a good big poultry farm as well."

* * * *

"I planted a dozen nemesias here and what do you think came up?"

"Why, nemesia flowers of course."

"Oh, no. The children's tortoise came up and ate the lot."

* * * *

"What is a quire of paper?"

"Oh, let me see! Yes, I know. It's a music roll for a pianola."

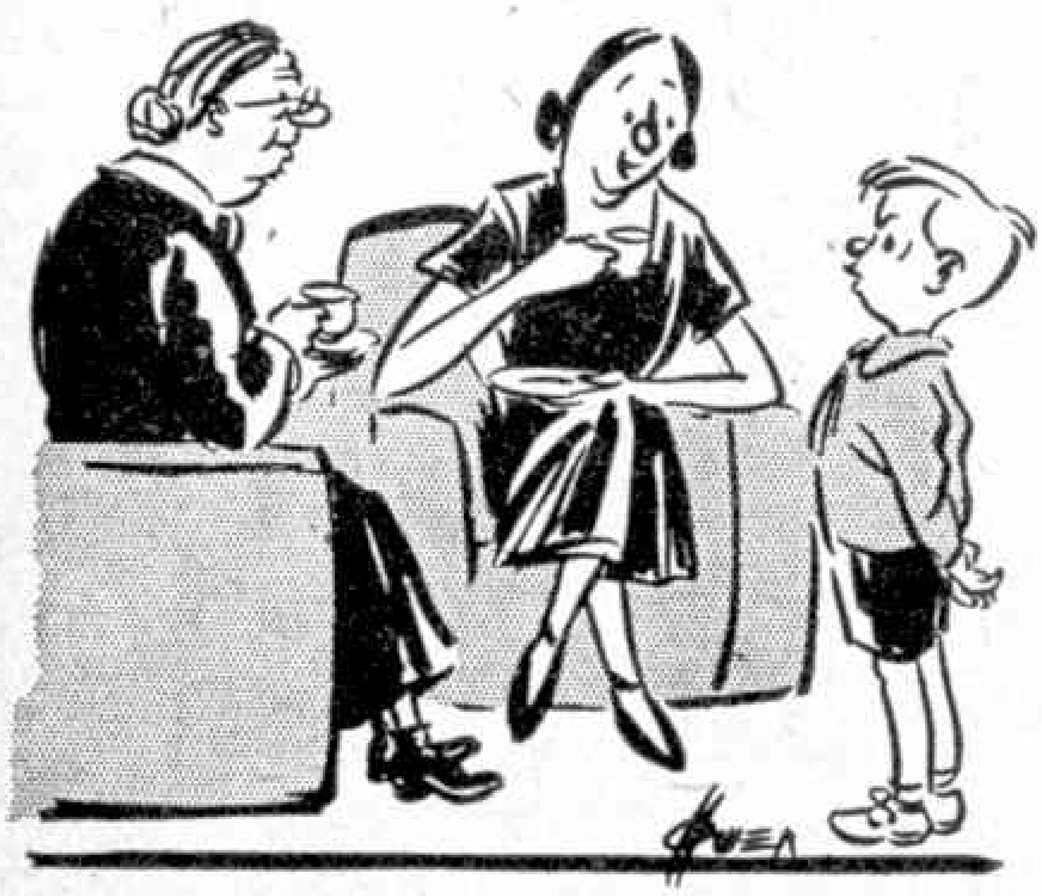
* * * *

"Yes, mum, I'm just out of a prison."

"Dear me! You should be ashamed to own it."

"I didn't mum. I was only a lodger."

* * * *



"Come and kiss your Auntie Kate, dear."
"Why mum? I haven't done anything wrong."

BRAIN TEASERS

WILL IT EVER BE PAID?

What would you do if you received the following bill?

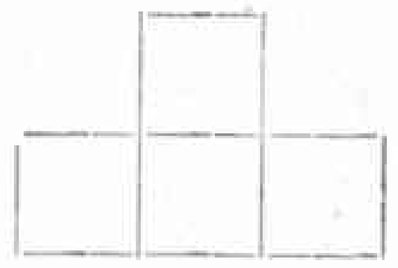
				£	s.	d.
NB	13582604	@	N/Pd. each ..		NK	ND
TS	2814	@	Kd. each ..	P	D	A
PE	73394	@	P/Od. each ..	O	O	D
				A	O	S

In it there are letters where there should be numbers, and numbers where there should be letters. These correspond; for example, if N represents 1, then 1 represents N. With this information can you make out the bill in proper form? F.G.

* * * *

MATCH SQUARES

The accompanying diagram shows how to make four squares with 13 matches. Can you remove three matches and change the positions of two others to form two squares? S.W.C.



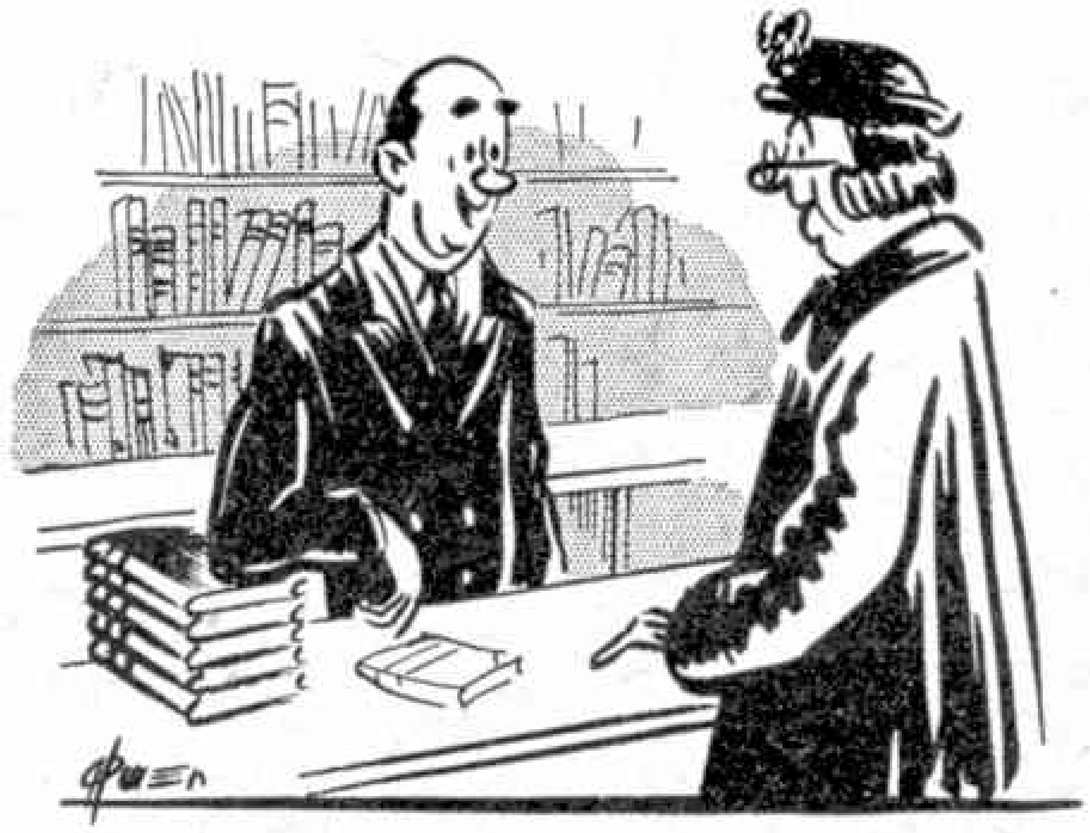
* * * *

CUBES THIS TIME

The number 50 is of some interest. It is the sum of the square of 7 and the square of 1, and also twice the square of 5. It is in fact the lowest number that can be expressed as the sum of two squares in two different ways.

Can you find the corresponding number for cubes, that is the lowest number that can be expressed as the sum of two cubes in two different ways. To prevent your making the search too wide, you are told that no number to be cubed is above 12.

* * * *



"I want a book for a boy of fifteen."
"Yes madam. Is he studious or normal?"

* * * *

SOLUTIONS TO LAST MONTH'S PUZZLES

In our first puzzle last month suppose the positions are numbered 1, 2, 3 etc. from the left. There are three steps in the solution, as follows: 1, move 2 and 3 to 6 and 7; 2, move 5 and 6 to 2 and 3; 3, move 1 and 2 to 5 and 6. This leaves two pennies in positions 3 and 4, and 3 halfpennies in positions 5, 6 and 7.

To make the sum in our second puzzle right take out the two 0s and move the figures 1 and 7 into the tens positions.

The countries and cities in our third puzzle are OSLO, LONDON, CHINA, HULL, CHILE and NEW YORK.

The four words of our final puzzle last month are ACHE, CAIN, HIND and ENDS, which form a word square.

YOU'LL HAVE MORE

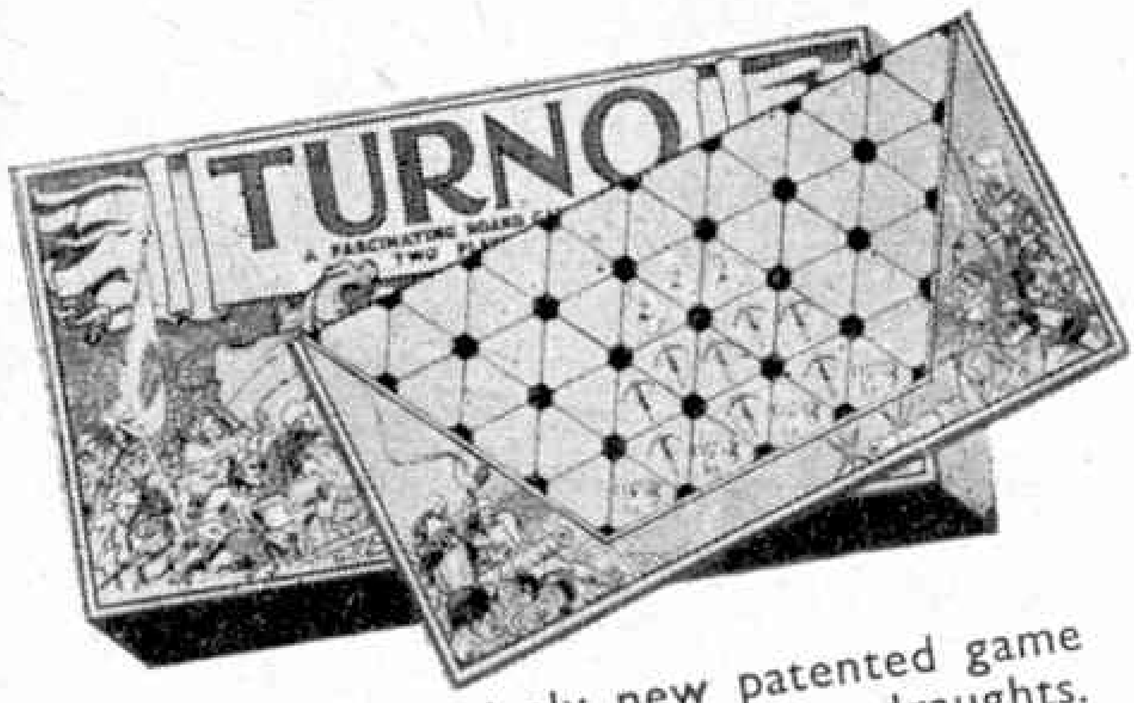
FUN

WITH

SPEAR'S GAMES

AND EVEN DAD
WON'T BE ABLE TO RESIST THEM

TELL ME: The queen of quiz games. Spin the wheel and roll out the questions! Endless fun for any age. Any number of players, the very thing for your party. **7/6**



TURNO: An entirely new patented game of tactics for two players. As easy as draughts. Provides many hours of fascinating entertainment. **9/-**

If your dealer cannot supply, write for address of nearest stockist to:

J. W. SPEAR & SONS LTD.
DEPT. M • ENFIELD • MIDDLESEX

Keep your eye on Halfords

. . . and be sure of the finest selection of spares, accessories and equipment, including a full range of "Halford" "Raleigh" and "Robin Hood" Cycles —there's a Halford's branch in every large town.

THE HALFORD CYCLE COMPANY LIMITED
HEAD OFFICE
239 CORPORATION STREET
BIRMINGHAM 4.

222 BRANCHES IN ENGLAND, SCOTLAND AND WALES

THE FUTURE IS YOURS
PREPARE FOR IT NOW

Maximum production, on which the life of the nation rests, depends on high technical skill. This gives marvellous opportunities to young men who have acquired such knowledge and efficiency as that contained in an I.C.S. Course of Instruction.

THE DEMAND FOR WELL-TRAINED MEN IS URGENT AND UNLIMITED — BUT THERE IS NO WORTH-WHILE PLACE FOR THE UNTRAINED

If you need technical training, our advice on any matter concerning your work and your career is yours for the asking—free and without obligation. Let us send you full information regarding the subject in which you are specially interested. DON'T DELAY. Make ACTION your watchword.

The successful man DOES to-day what the failure INTENDS doing to-morrow. Write to us TO-DAY.

Generous Discount granted to members of H.M. Forces

The I.C.S. offer Courses of Instruction in a wide range of subjects, including:

Accountancy
Advertising
Copy Writing
Advertising Management
Air and Vacuum Brakes
Air-Conditioning
Arable Farming
Architecture
Boiler Engineering
Book-keeping
Building
Business Training
Business Management
Carpentry and Joinery
Chemical Engineering
Chemistry, Org. & Inorg.
Civil Engineering
Clerk of Works
Coal Mining
Commercial Art
Concrete Engineering
Diesel Engineering
Draughtsmanship
Drawing Office Practice
Electrical Engineering
Eng. Shop Practice
Fire Engineering
Foremanship
Heating and Ventilation
Horticulturist
Hydraulic Engineering
Hydro-Electric
Illumination Engineering
Journalism (Free Lance)
Machine Designing
Maintenance Engineering
Marine Engineering
Mechanical Drawing
Mechanical Engineering
Mine Surveying
Mining Electrical
Motor Engineering
Motor Mechanic
Plastics
Production Engineering
Quantity Surveying
Radio Engineering
Radio Service Eng.
Railroad Engineering
Refrigeration
Salesmanship
Sales Management
Sanitary Engineering
Sheet-Metal Work
Short-Story Writing
Steam Engineering
Structural Steelwork
Surveying
Telegraph Engineering
Television Technology
Toolmaking
Welding, Gas and Elec.
Woodworking Drawing
Works Engineering
Works Management

And most of the Technical, Professional, Commercial, Educational and Civil Service Exams.

(Examination students are coached till successful.)

YOU MAY USE THIS COUPON

(Penny stamp on unsealed envelope)

INTERNATIONAL CORRESPONDENCE SCHOOLS LTD.
Dept. 218, International Buildings, Kingsway, London W.C.2

Please send your free booklet describing I.C.S. Courses in.....

Name..... Age.....
(BLOCK LETTERS PLEASE)

Address.....

.....

ICS

MODEL MAKER – *YOUR Magazine!*

YES, MODEL MAKER is a magazine you will enjoy. It covers almost the whole range of model making interests that are yours. Month by month there are interesting features on model railways—particularly the small 00 and 0 gauges, with hints and tips on clockwork and electric running, how-to-make articles, and the scenic side, bridges, lineside buildings, signals, etc. Then there are model boat articles, model yachting—W. J. Daniels is now describing a new racing yacht—power boats, steamers, hydroplanes, etc. Regular model architectural series — essentially "how-to-do-it." Models cars too have their place, racing, scale, and "solid." Each month too there is an unusual model angle—perhaps a working model windmill, a harbour in the lilypond, model trams, but something "different" every month. You may be lucky enough to get an odd copy at your model-shop or newsagent, but if not send 2/- p.o. and we will send you the latest number with details of photographic and model railway contests free to all.

68 fact-packed pages size 9¾ in. x 7½ in. on high quality white paper profusely illustrated, 2/- every month.

MODEL MAKER, Dept. Mco2
THE AERODROME, BILLINGTON ROAD
STANBRIDGE, Nr. LEIGHTON BUZZARD, BEDS.

To *Model Maker*, Dept. Mco2, The Aerodrome, Billington Road, Stanbridge, Nr. Leighton Buzzard, Beds. I enclose 2/- for latest issue of *Model Maker*. (Use plain paper if you do not wish to cut your copy).

Name .....

Address .....

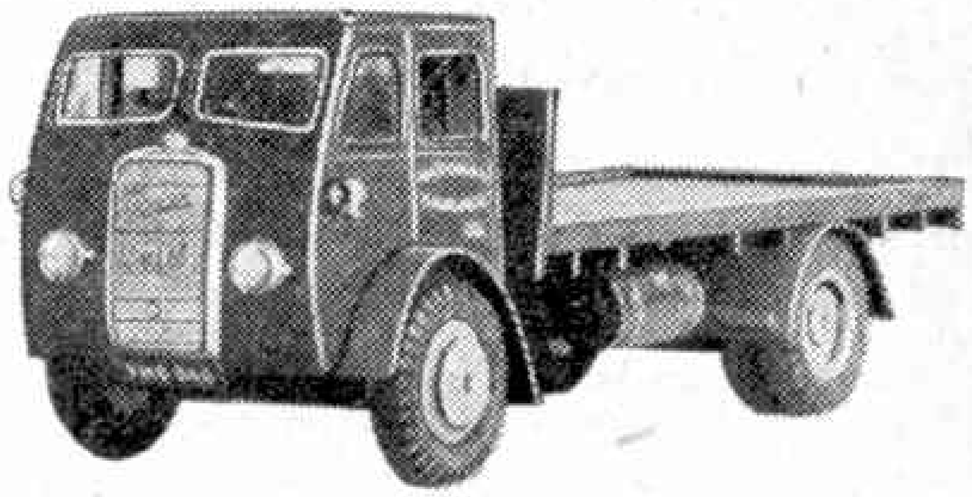
HIGHSTONE UTILITIES

Meters. 15 v., 2½ in., m/c, **9/6**; 150 v., 2 in., m/c, **10/–**; 15/600 v., 2 in., m/c, D.R., **8/–**; 100 m/a., 2 in., m/c, **7/6**; 3.5 amp., 2 in. T.C., **5/–**; 4 amp., 2½ in. T.C., in case with switch, **7/6**; Meters. Units containing 2 500 microamp movements, **5/–**, post **8d.** All meters post extra.
Bell Transformers. These guaranteed transformers work from any A.C. Mains, giving 3, 5, or 8 volts output at 1 amp., operate bulb, buzzer or bell. Will supply light in bedroom or larder, etc. Price **8/–**, post **6d.** BELLS, **6/–**.
Ex-R.A.F. 2-valve (2-volt) Microphone Amplifiers as used in plane inter-com., in self-contained metal case; can be used to make up a deaf aid outfit, intercommunication system, or with crystal set, complete with valves, **20/–**. post 1/6. Ditto, less valves, **10/–**. **Hand Microphones,** with switch in handle, and lead, **4/–**. Similar instrument, moving coil, **7/6**, post **6d.**
Mike Buttons (carbon). **2/–**. **Moving Coil, 4/6; Transformers, 5/–**. All post **4d.** each.
Soldering Irons. Our new streamlined Iron is supplied with two interchangeable bits, one each straight and curved; 200/250 v. 50 watts, **10/–**. **Standard Iron** with adjustable bit, 200/250 v., 60 watts, **11/–**. **Heavy Duty Iron,** 150 watts, **14/6**, all post **6d. Crystal Sets.** Our latest Model is a real radio receiver, fitted with a permanent crystal detector, **10/6**, post **6d.** De Luxe Receiver in polished cabinet, **18/6**, post **1/–**. Spare Permanent Detectors, **2/–** each. When ordered separately, **2/6**, with clips and screws, **2/10**, post **3d.** Headphones, brand new, S. G. Brown, G.E.C., etc., **15/–**, **23/–**, and super-sensitive, **30/–**, post **8d. New Headphones, 10/–**. Balanced armature type (very sensitive), **12/6**. Both post **8d.** New **Single Earpieces, 3/6.** Bal. armature type, **4/6**; ex-R.A.F. earpiece, **2/–**, post **4d. Headphones,** in good order, **5/6** (better quality, **7/6**), all post **8d.**
Letters only. Money refunded if not completely satisfied.

58, New Wanstead, London E.11
Illustrated List sent on request with 1d. stamp and S.A.E

MUCH MORE FUN

TO BUILD YOUR OWN LORRIES THAN TO BUY 'READY MADE'



4 mm. and 7 mm. lorry kits, 24 'no-tools-to-make-'em' outfits and a host of spare parts.

ILLUSTRATED CATALOGUE
1/- post free

WILSON'S LORRIES LTD.
Dept. M
6, Gt. Winchester St., London E.C.2

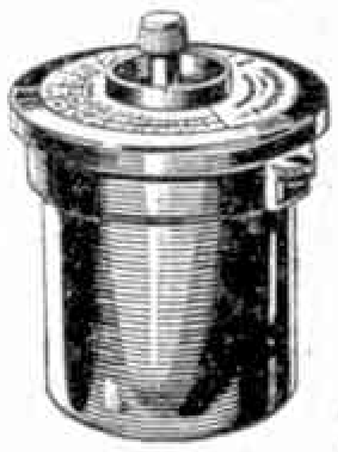
AMATEUR PHOTOGRAPHERS MUST TRY THIS NEW CONCENTRATED LIQUID FINE GRAIN DEVELOPER

Unitol

After long research Johnsons are now able to present a ready-to-use, concentrated, liquid fine grain developer. One ounce of Unitol, suitably diluted, is used once to develop one film and the solution is then poured away. No trouble, no waste. Gives wonderful negatives. A simple Calculator is also sold, giving developing times for all dilutions from 6 to 25. Unitol is ideal for the tank development of roll films.

225 cc. (8-oz.)	..	3/6
570 cc. (20-oz.)	..	6/6
Unitol Calculator	..	4d.

JOHNSONS OF HENDON
LONDON N.W.4



JOHNSON J-20 TANK

For developing size-20 roll films in daylight. Takes 10½-oz. of solution. Easy-to-load, sturdy one-piece spiral. Pouring lip for splash-free emptying. Triple light-trapped lid. Complete with new Two-Way Agitation movement and a Calculator Disc.

PRICE 25/-

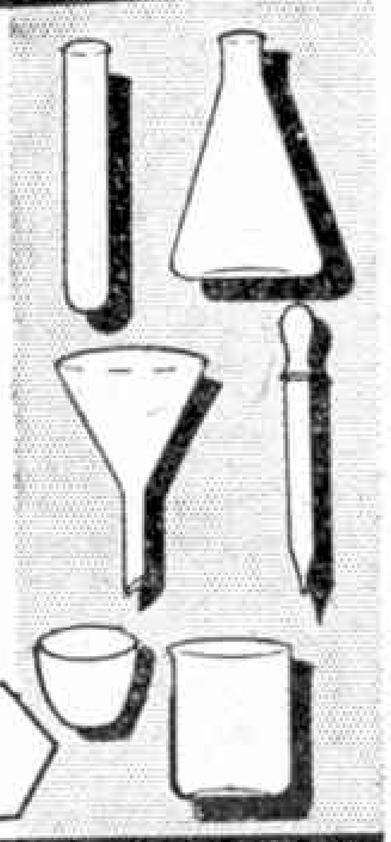
LOTT'S *Chemistry*

Convert your chemistry set to a student's laboratory by easy stages.

Supplies of spare apparatus and chemicals are now available.

Also Lott's Stone Puzzle together with free book of 105 problems.

Ask to see them at your dealer or write to the manufacturers for current price list, enclosing stamped addressed envelope 1d.



A SMALL SELECTION FROM OUR LIST

LOTT'S BRICKS LTD
(Dept. M.M.4) WATFORD · HERTS

THE ASTRA
3-LIGHT SIGNAL
No. 29

This splendid working model signal is proving as popular as ever. The Red, Green and Amber lights work in correct sequence off a small torch battery. Just the thing for your trains or cars. Get yours from your local Astra dealer while he still has stocks.

Price 7/9
Plus 1/8 Tax

Sole Patentees and Manufacturers:

ASTRA PHAROS LTD.
239, EARLS COURT ROAD, LONDON S.W.5

Φ1/C

Hey—look at this wizard bike!

The **RALEIGH** Lenton Sports (Girls' Model also available). *(Dynamo lighting 48/9 extra).*

£19.5.0

It's a world champion's machine, too!
Gee! Fancy being able to ride exactly the same model as Reg Harris! Yes, he uses a Raleigh LENTON SPORTS for all his road training . . . Just wait till you chaps see me next week. I'll have my *new* Lenton by then! Dad's taking me to Currys on Saturday.

"Lucky Dog! I've always wanted a Lenton Sports, with that wizard Reynolds '531' lightweight tubing!"
"Look! Sturmey Archer 4-speed gears. The hub is specially built with a light-alloy casing!"
"What a super finish! Special Chromatic Green, they call it. And those smashing transfers . . . !"

Currys LTD.

OVER 220 BRANCHES

FREE
Wizard cycle folder in colour from CURRYS LTD., 77, Uxbridge Rd., Ealing, W.5

PECO - PLAN

YOUR "00" LAYOUT

Peco Foundation Tapes combined with Peco Point Foundation Plans enable you to lay out your track work on the baseboard and to try out various formations before actual track laying begins. This saves all the work of transferring the layout from the drawing board to the baseboard.

When you come to lay the track the position of every sleeper, rail fixing, frog, etc., is shown on these printed tapes and plans — no mathematical calculations or uncertainty.

Your Peco Stockist can supply the Foundation Tapes and Point Plans.

The Peco Platelayer's Manual, post free 6/9
Fully illustrated Catalogue, post free 1/3

THE PRITCHARD PATENT PRODUCT CO. LTD.
PECOWAY, STATION ROAD, SEATON, DEVON

Mamod

MINOR No. 2 STEAM ENGINE

The perfect miniature power-plant to drive your models

32/6
inc. Purchase Tax

We regret to announce that due to metal shortages, Mamod Steam Engines will again be in very short supply, so see your dealer to-day.

MAMOD MINOR No. 1 STEAM ENGINE 23/6 inc.Tax
MAMOD S.E.1 STEAM ENGINE ... 42/6 inc.Tax
MAMOD S.E.2 STEAM ENGINE ... 52/6 inc.Tax

ALL MAMOD ENGINES AND WORKING MODELS FIT MECCANO AND ARE 100% GUARANTEED

MALINS (ENGINEERS) LIMITED
25-31, CAMDEN STREET, BIRMINGHAM 1

BOND'S SPECIAL OFFERS

WHILST STOCKS LAST

Double Output Transformers, suitable for Hornby-Dublo trains, etc. Input 210-240 volt A.C. Output 12 volt 20 watts. These transformers will work two trains with ease.
Price **28/6**, postage and packing 1/-

Cedar Wood. 3/32 in. x 2 in. x 18 in. long, well seasoned wood, smooth finish, suitable for all model work.
Price **4/6** per doz. lengths, postage and packing 10d.

British Railways Paints and Transfers

We can supply the new B.R. Paints and Transfers correctly matched and copied from the originals kindly supplied to us by the Railway Executive.

Paints

Locomotive, green or blue ..	**1/3** per pot
Coach, red or cream	**1/3** per pot

Transfers

	Gauge	"00"	"0"
Totems, small ..	..per pair	**6d.**	**6d.**
large ..	..per pair	**6d.**	**6d.**
Loco. Numbers, 1-0..	..per set	**6d.**	**6d.**
Coach Numbers, 1-0	..per set	**6d.**	**6d.**
Class Numbers "1"	..per doz.	**9d.**	**9d.**
Restaurant, Buffet, Sleeper or Kitchen ..	..per pair	**6d.**	**9d.**
Guard..	..per doz.	**6d.**	**9d.**

All Prices plus postage

BOND'S O' EUSTON ROAD LTD.
357, EUSTON ROAD, LONDON N.W.1
Est. 1887 *'Phone: EUSton 5441/2*

MORE ACCESSORIES FOR YOUR "00" RAILWAY

Large barrels	**2½d.**	Sacks of potatoes	**2½d.**
Small barrels	**2d.**	Bags of cement	**2½d.**
Milk churns	**2½d.**	Tar barrels ...	**5d.**
Beer barrels	**5d.**	Oil drums ...	**5d.**
Plastic coal	**6d.**	Loco crew: Driver and fireman ...	**1/6**
4 people on seat	**4/4**	Sets of luggage 9 pieces ...	**1/10**
8 people on seat	**7/11**		
Sacks of flour	**2½d.**		

SPECIAL OFFER
of fully tested high capacity Can Condensers. For your power pack:

250 Mfd. 12 volt ... **2s. 6d.** each
500 Mfd. 12 volt ... **3s. 9d.** each

TRADE SUPPLIED

GEORGE BRADSHAW
5 and 6, Western Road
Hove, Sussex

You'll never catch

REG HARRIS

riding anything but

DUNLOP

50H/356

. . . the mark that stands for all that's best in 00 railway modelling

ERG STOCKISTS hold the widest range of first-class model railway goods as listed in—

The ERG CATALOGUE and MANUAL

Price 2s. 6d. (by post 2s. 9d.)

Build your **ROLLING STOCK from ERG "PRECISION" CARD PARTS** with the aid of the record-breaking textbook—

"CARDBOARD ROLLING STOCK and HOW TO BUILD IT"

Price 2s. 6d. (by post 2s. 9d.)

29 types of wagons and vans and 12 coaches available.

A FASCINATING NEW TEXTBOOK for the RAILWAY MODELLER.

"A Review of THE MODEL RAILWAY"

Facts and Features of 00 Railway Modelling (with 13 photographs and 14 diagrams). **Price 3s. 6d.,** by post **3s. 9d.**

This new textbook by E. Rankine Gray, who treats the subject from an entirely new and practical angle, will prove of great value to all modellers, whether inexperienced or advanced. Get a copy *to-day* from your local model shop or, if you are not within reach of an ERG Stockist, order direct from

ERG (Bournemouth) LTD

529, ROUMELIA LANE, BOSCOMBE, BOURNEMOUTH

Telephone: Boscombe 33431

Deal with your local ERG Stockist wherever possible, but if unable to obtain your requirements locally, you are of course welcome to order direct from us.

SPARKS' DATA SHEETS

ARE NOW RECOGNISED as the Finest and Most Reliable Radio Constructional Sheets obtainable. They provide "Easy-to-Follow" Full-size Assembly and Wiring Plans of Tested and Guaranteed Designs, plus Detailed Descriptive matter which render previous Radio experience unnecessary.

THE "POCKET PAK" PORTABLE. A fine little one-valve all-dry battery Set for Medium waves. Completely self-contained except 'Phones. Fine 'Phone signals from the 'local' Stations, or greater range with a short aerial. Only 7¼ x 3¾ x 1¾ in. Very popular. Data/S, **2/9.**

THE "JUNIOR" ONE-VALVER. Another all-dry battery design giving good 'Phone signals on Med. and Long waves in any district with short aerial, **2/6.**

FORTY OTHER DESIGNS AVAILABLE, SEND STAMP FOR LATEST LIST No. 38/48.

ALL COMPONENTS CAN BE SUPPLIED

SPARKS' DATA SHEETS (MM)

48a, High Street, Swanage, Dorset

CIGARETTE CARDS

Send 4d. for our new Catalogue of over 1,000 different series. Albums to hold 200 cards 1/9½, for 100 cards 1/3. SPECIAL OFFER. 100 different cards 2/6 post free.

E.H.W. LTD.

Dept. 'M,' 42, Victoria St., London S.W.1

Have you a *working* model railway, or do you do all the work?

Enjoy the fascination of watching your railway function automatically. Send for our ever-popular "Switch to Realism" **2/9** Post Free. **Railway Hobbies Ltd., 86, Essex Rd., Southsea**

CHEMISTRY APPARATUS

Send Stamp for COMPLETE **PRICE LIST**

BOOKLETS:
"Experiments" 7d.
"Formulas" 10d.
"Home Chemistry" 2/3
Post Paid

BECK (Scientific Dept. G), 60, High Street STOKE NEWINGTON, LONDON N.16

STUDY AT HOME FOR THE NEW

GENERAL CERTIFICATE OF EDUCATION

The London 'Matric.' and 'School Cert.' examinations are to be replaced by that for the **GENERAL CERTIFICATE OF EDUCATION** Wolsey Hall (est. 1894) prepares students **by post** for this and other exams., including London B.A., B.Sc., Prof. Prelims., etc. Low fees, instalments. **PROSPECTUS** from Director of Studies, Dept. GK50,

WOLSEY HALL, OXFORD

NEW!

Lack of inches doesn't worry TICH—thanks to his "CLEAR-VIEW"

PERISCOPE

A useful and instructive Scientific Instrument. Send for yours NOW

PRICE **5/6** post free

Money refunded if not satisfied

HAMMONDS 1487, LONDON ROAD NORBURY, LONDON S.W.16

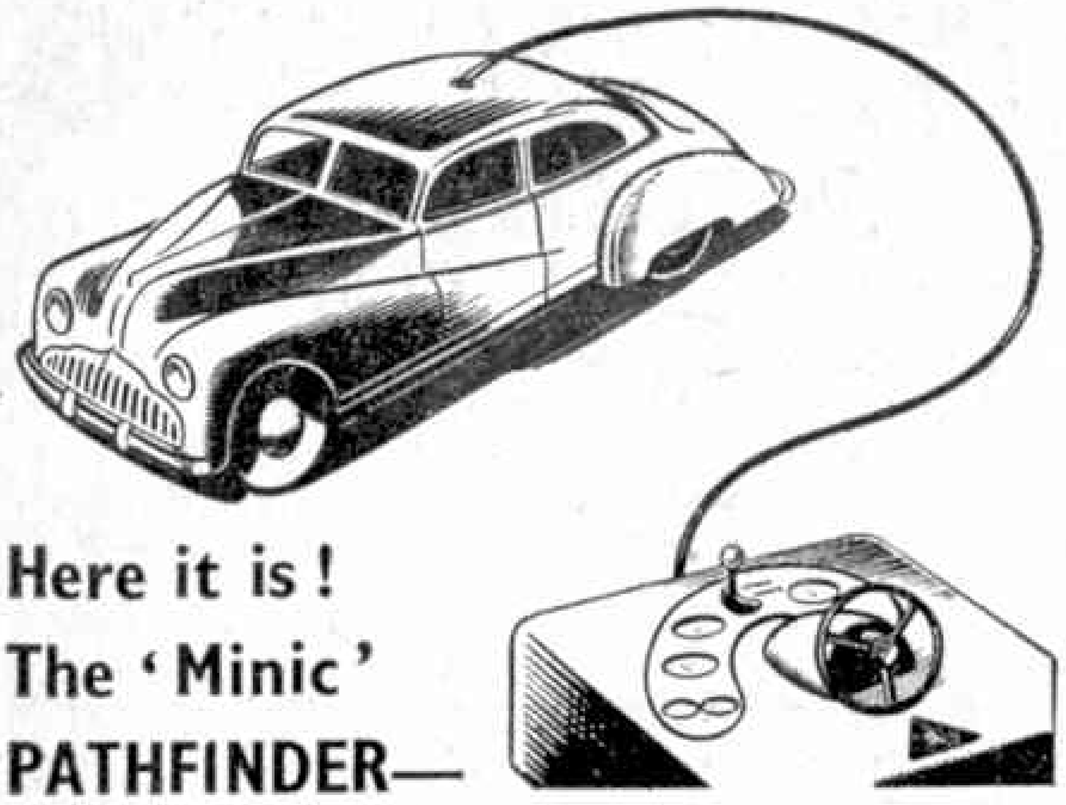
The Observer's Book of

BRITISH ARCHITECTURE

English Architecture from Saxon time until the present day. Also a valuable feature—The Visual Index. Containing 270 separate illustrations, 125 having a second colour. Showing doors, columns, windows, vaults and ceilings, etc. ... ... **5s. net.**

Don't miss this valuable book.

FREDERICK WARNE & CO. LTD.
1, Bedford Court, London W.C.2



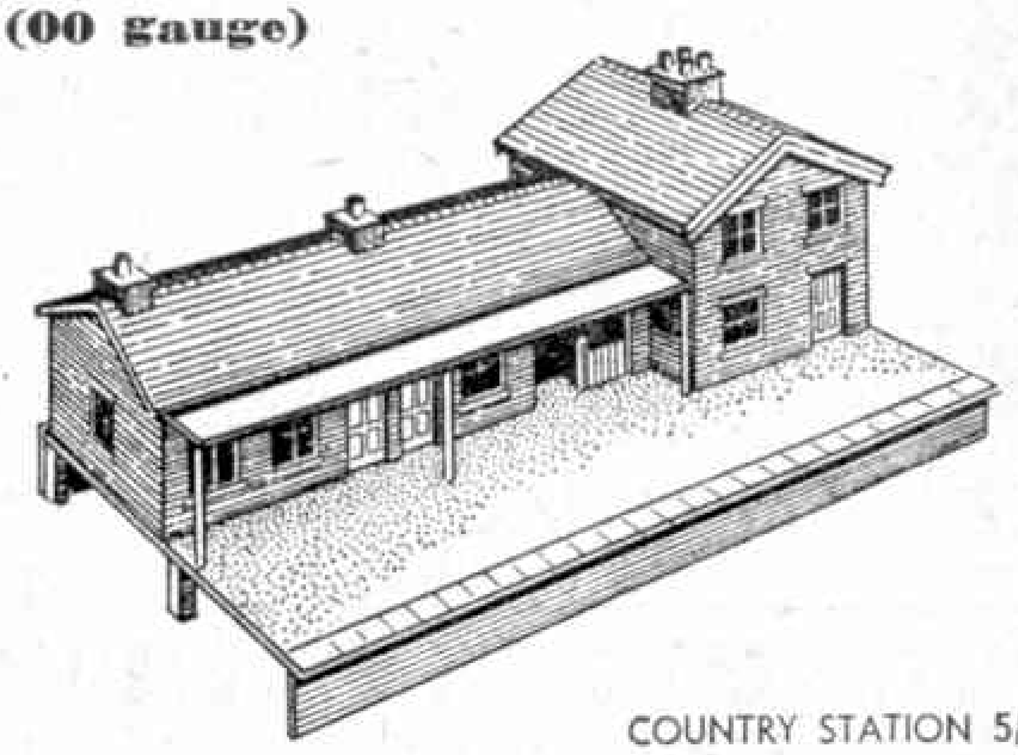
Here it is!
The 'Minic'
PATHFINDER—

an all electric—Reversing—Remote Control car. Driving and electro-magnetic steering are operated from the control box which contains six standard U.2 torch cells that power the motor. The modern streamlined car is 7" long. Price 39/6; 6 Batteries 3/- extra; Packing and Postage 1/9.

Hamleys
Estd 1760
HAMLEY BROTHERS LTD

200-202, REGENT STREET, LONDON, W.1
(Our only address) *Telephone: REGent 3161*

Announcing
"LINESIDE" KITS
(00 gauge)



COUNTRY STATION 5/6.

These kits contain plans, brick and tile building papers, printed card and wood parts, and printed celluloid windows. Really authentic and detailed true-to-scale designs. The first off are:
LARGE SIGNAL CABIN 3/8. PLATFORMS 3/8.
WATER TOWERS (2 types in 1 kit) 2/9.
Postage: Single kit for 6d., two or more 10d.

★ *The full Modelcraft List for 1951 gives details of over 600 plans, planbooks, kits and accessories for every branch of Modelmaking. It costs 1/- post free and includes a 1/- refund voucher for use in buying Modelcraft goods.*

Modelcraft Ltd.
77 (H), Grosvenor Rd., LONDON S.W.1

BOOKS:

Combined A.B.C. B.R. Locos.	9/6
"Working Model Railways"	3/-
"Miniature Traffic Working"	3/6
"00 Gauge Layout and Design"	3/6

DIECAST LOCOS., 12 V. D.C., SUITABLE HORNBY-DUBLO USE:

0-6-0 G.W.R. Pannier Tank	70/3
0-6-2 B.R. Tank	68/-

RAILWAY ACCESSORIES:	00	0
Wood Halt Stations	7/-	7/4
Wood Island Platforms	6/5	9/6
Diecast Station Staff with Luggage ..	—	2/10
Plastic Station Figures .. .. per set	3/0½ and 5/2	3/8
Plastic Loco. Crews .. .. per set	1/6	1/10
Sitting Plastic Figures .. .. per set	4/11	7/4

Postage extra "00" or "0" Parts List 3d. per post.
TYLDESLEY & HOLBROOK (M.E.T.A.)
109, DEANSGATE, MANCHESTER 3

New Railway Books

BULLEID PACIFICS OF S.R. -	11/3
TRAINS OF BRITAIN - -	2/9
SNOWDON MOUNTAIN RLY.	2/9
TRAINS IN COLOUR - - -	1/8
ABC MOTORCAR SPOTTING	2/2

and all the latest
ABC OF BRITISH LOCOMOTIVES
(4 Regions) - - - each 2/2

Ian Allan Ltd 33, KNOLLYS ROAD LONDON S.W.16

WEBLEY AIR PISTOLS

Marvellously accurate for target practice

No licence required to purchase for use on enclosed premises.

Senior **Mark 1**
Junior **Webley Air Rifle**

Write for list. WEBLEY & SCOTT LTD.,
87, Weaman Street, Birmingham, Eng.

CIGARETTE CARDS

"Junior" Catalogue (24 pages) - - **6d.** post free
100 different Cards and Catalogue **2/9** post free

THE LONDON CIGARETTE CARD COMPANY LTD.
Box M2, 30, Wellesley Rd., Chiswick, London W.4

HORNBY GAUGE O ELECTRIC TRACK
Made from New Stock or your old converted. Write terms.
Scottish Modelcraft, 7, St. Mary's Street, Dumfries

STAMP ADVERTISEMENTS

(See also pages 280 and 282)

STAMPS 100 good F. and Colonial Pictorials (inc. A.M's. Commems., etc.) **2/6.** Free gift with each pkt.—**H. Tucker, 13. Milton Cres., Ilford, Essex**

HALF PRICE APPROVALS
M. THEOBALD. 6, Dell Corner, West Drayton, Middlesex

FREE G.VI G.B. 10/- now obsolete. Send 3d. post, request approvals. **Goddard, 29. Arcade, Boscombe, Hants.**

PEASANT COSTUMES FREE — Austrian Set of 6 Stamps to Approval Applicants—2½d. postage please. **MALCOLM MATSON. 306, London Rd., STAINES, Mx.**

2,000 STAMPS FREE! Send 2½d. for details of this gift and 25% discount approvals. **YEOMAN, 18, Devon Road, Hersham, Surrey**

CIGARETTE CARDS!

SPECIAL OFFER! 2 Sets, Album and Catalogue, **2/6** post free.
ALBUMS to hold 200 cards, **1/9**, for 100 cards, **1/1½d.**, for 64 cards, **9d.** FOUR COMPLETE SETS, **5/-.**
CATALOGUE of over 1,000 series, **4d.**
ALL POST FREE!
J. H. DAVIS & CO. (Dept. M.M.)
'The' Cigarette Card Specialists, Brentford, Middlesex

PERSONAL ATTENTION MEANS A LOT TO THE MODELLER
We have the largest stock of model materials, aircraft and railway kits and accessories in the North. Your mail order by return. Send 4d. stamp for eight-page list.
WILMSLOW MODEL CO.
Water Lane, WILMSLOW, Cheshire

CIGARETTE CARDS

FREE! Send postage only for Catalogue of hundreds of Complete Sets, Assorted Mixture, Albums, etc.
★ **108-page ILLUSTRATED Catalogue 2/6** ★
We send cards to all parts of the World. You can order with confidence.
TOMPKINS (Dept. MD)
152, WOODCOTE ROAD — WALLINGTON — SURREY

AMERICAN MAGAZINES
Popular Mechanics, Popular Science, Model Railroader, Model Airplane News, Trains, etc., available by subscription. Catalogue from: **PETER F. HOBSON, DEPT. M.M., 79. SOUTHBROOK ROAD, EXETER**

Crystal Set Kits 15/- Complete with instructions. Endless entertainment and no further expense. Ideal for School or College. Lightweight Headphones **15/-.** All post free.
W. Buckle (Dept. M), 77, Horringer Rd., Bury St. Edmunds

PLENTY OF BACK NUMBERS AVAILABLE
of "Meccano Magazines" (large 9d. each, small 6d. each), "Trains Illustrated," (Nos. 3 onwards), 1/- each, "Buses Illustrated" (Nos. 1-7), 1/6 each. Also Bus, Tram and Loco. postcards—
Lens of Sutton, 50, Carshalton Road, Sutton, Surrey

Learn Shorthand by 1st July. (1 hour's study nightly). 1st lesson 2½d. stamp. **Duttons (Dept. MO), 92, Gt. Russell St., W.C.1**

When writing to Advertisers please mention THE "MECCANO MAGAZINE"

MECCANO MAGAZINE

Registered at the G.P.O., London, for transmission by Canadian Magazine Post.

EDITORIAL AND ADVERTISING OFFICES:
LIVERPOOL 13, ENGLAND.
Telegrams: "Meccano, Liverpool."

Readers' Sales and Wants. Private advertisements (i.e., not trade) are charged 1d. per word, minimum 1/-. Cash with order. Readers' advertisements are published as soon as possible; inclusion in the first issue after receiving them cannot be guaranteed.

READERS' SALES AND WANTS

SALES

2,000 Stamps, catalogue value £30; England and Colonies, Europe, North and South America. Would separate. What offers?—Quiney, 209, Bedford Hill, London S.W.16.

Gauge 0 Hornby Clockwork Locomotive, Rails, Four Trucks, Points, etc., 27/- complete.—J. Ashworth, 312, Guildford Road, Southport.

Large quantity of Trix Twin Electric Railway for disposal, either complete or separately. Please write for price list to Box "M.M." No. 10.

Hornby M.3 Clockwork 0-4-0 Tank Locomotive and Sutcliffe Battleship "Valiant," 12/6 each, both run as new. Also large stocks to clear of "M.M.s," Books and Magazines on Railways, Flying, Cycling, etc. Aero-modelling sundries, Sports Gear, Dinky Ships, Aircraft. Write for lists.—J. Mills, The Gables, Puckeridge, Herts.

Hornby Electric Goods Set. Sale or exchange for Trix Set. S.A.E. details Box No. 11.

Bowman "Snipe" steam driven Speed Cruiser £4; Masterbuilder No. 2, £1; Tent £1; all in very good condition. Apply—Hamer, Paulerspury, Towcester, Northants.

WANTS

Hornby "*Princess Elizabeth*" Electric Train. Complete Set or Loco., Tender, and Transformer only. Good condition. State price and details.—Denis Brereton, Baton, Motueka, New Zealand.

Pre-war "M.M.s," Leaflets and Instruction Manuals. Please send full particulars to B. Baxter, 9, Harris Street, Huntly, New Zealand.

Second-hand Meccano Outfit No. 8, 9 or 10.—Gloyne, 2, The Paragon, Bristol 8.

Geared Roller Bearing No. 167, Channel Segments No. 119, Shuttle No. 104, Wood Rollers No. 106, Digger Bucket No. 169, Octagonal Coupling No. 63a, Electrical Parts Nos. 181, 182a, 183, 201, 202, 203, 204, 205, 206, 207, 207a, 208, 208a, 210. Elektron Parts Nos. 1538, 1539, 1563, 1569, 1570, 1575, 1583, 1586, 1587. Electric Motors E1, E120, E20b, E1 Motor Pinions. Dinky Toy Horses (No. 2a). Manuals—"Standard Mechanisms," "How to Use Meccano Parts," "Books of Prize Models" and "New Meccano Models." "M.Ms.," Nov. 1936 and January 1938 to December 1940, preferably bound. Super Model Leaflets Nos. 4, 16, 16a, 32. Reply stating quantity, condition and price to Thomson, 44, Shirley Avenue, Leicester.

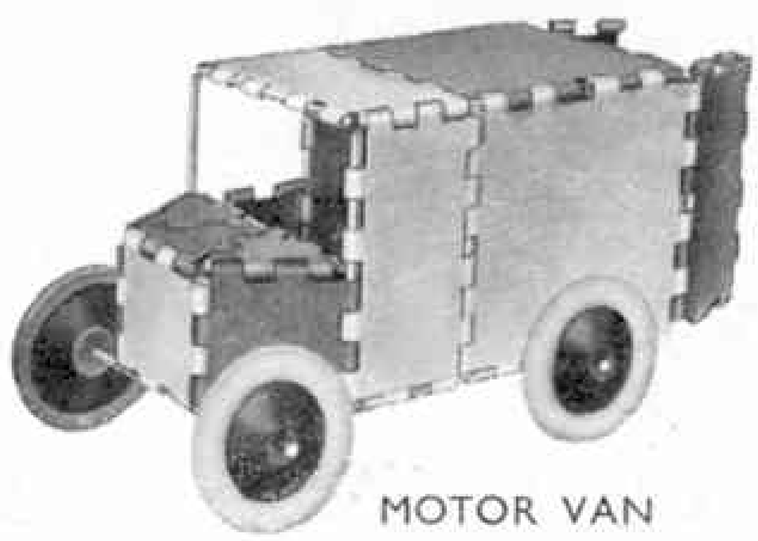
"M.M.s" January and March 1950. Must be in good condition.—V. J. Butler, 18, New Road, Bedfont, Middlesex.

Urgently required. Any of the following Hornby Locomotives: No. 2 Special, No. 3 Special either Clockwork or 20v. Electric; No. 2 Passenger Coaches; No. 2 Goods Rolling Stock; Gauge 0 Track and Accessories. Must be in good condition. Please reply Air Letter.—C. Cottrell, 324, Mazill Road, North Kenington Park, Adelaide, Australia.

Will Overseas Stamp Collector exchange duplicates for British varieties?—Collector, 22, Heath Terrace, Leamington Spa, Warwickshire.

DINKY BUILDER

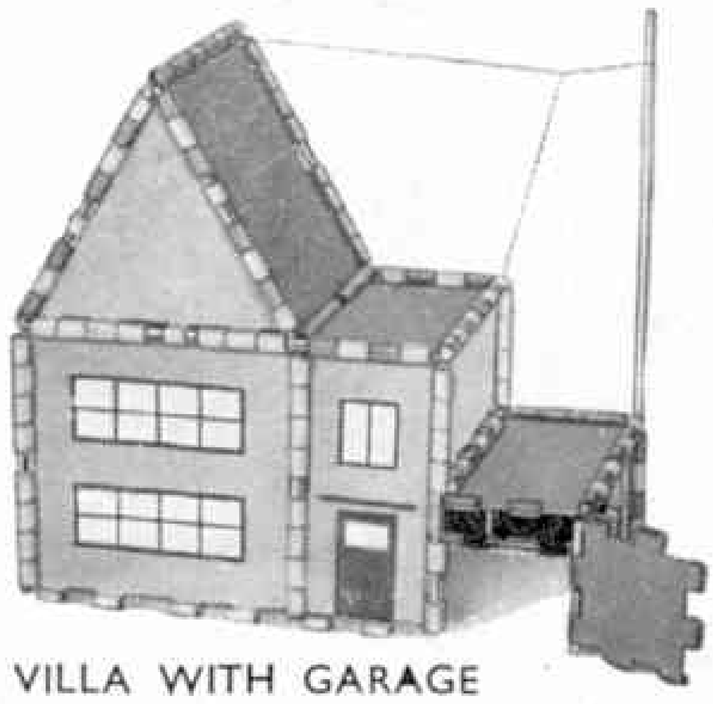
The SIMPLE Building Toy



MOTOR VAN

Simplicity is the keynote of this fascinating building system. With Dinky Builder hinged plates and rods the youngest children can build all kinds of models with the greatest ease—Furniture, Buildings, Windmills, Wheel Toys and scores of others.

The parts are beautifully enamelled in blue and yellow. They can be used over and over again. Nuts and bolts are not used in this system.



VILLA WITH GARAGE

Another lucky MECCANO Boy

Exciting job making a model crane with Meccano . . . A proper engineering job that really works. When you have played with one model you can take it to pieces, and try out another one—perhaps more difficult! There's no end to the fun, and that's why it's so exciting to have a Meccano Outfit.

MADE BY
MECCANO LTD
LIVERPOOL

PUBLISHED BY MECCANO LTD., BINNS ROAD, LIVERPOOL 13, ENGLAND.
Printed by John Waddington Ltd., Leeds and London.